

UNIVERSITY OF KWAZULU-NATAL

**Enterprise Resource Planning System Implementation success in South
Africa and the role of a Managed Implementation Methodology**

By

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List of Abbreviations and Terms:

| Abbreviations Or Terms | Meaning |
|-----------------------------------|---|
| PLM | Project Lifecycle Management |
| SAP | Systems Applications and Programmes (Software) |
| KPI | Key Performance Indicators |
| PMBOK | Project Management Body of Knowledge |
| PRINCE2 | Projects in a Controlled Environment 2 |
| Blueprint | A document that defines all the activities, processes and required developments that will allow for the understanding and replication of the customer’s business activities and operations in an ERP project. (Demand_ERP, 2016) |

Abstract

Over time Enterprise Resource Planning (ERP) systems have evolved to become the primary business management systems within Corporate Information Management. These modern systems support the organisational value chain by providing real-time information in an integrated cross business function environment. The objective being quality information provided in a seamless communication platform to the organisation at large, with the key benefit being a single source of information that repeatedly provides consistent business answers.

However, not all ERP implementations have been deemed successful or at least been viewed as successful by all or some organisational stakeholders. This perception of failure is complicated by the dynamics of different levels of Stakeholders within the project influence. ERP implementations affect the entire organizations in terms of process, people, technology and even culture and implementers of these systems need to appreciate the complexities of the variable dynamics that extend the reach of the technology implemented. These complexities have evolved beyond the value perception of the software, into an integrated matrix of people, data, and processes that interact and connect on a technology platform.

The research focus on utilising quantitative research on a selected population of modern ERP implementations within restricted geographical areas in South Africa. The perception of project success of stakeholders and project team members within these organisations are then analysed to identify any correlation of project implementation activities, with the goal to further improve project efficiencies. The results confirm that subjective research in terms of the measure and the definition of project success could be utilised in the improvement of implementation methodologies, but should be assessed in terms of project quantitative measures such as the project return on investment and qualitatively in terms of supporting corporate strategy in conjunction with individual responses.

Chapter One

Introduction

1.1 Introduction

With the rapid evolution of technology over the last 20 years, Olhager (2013) highlights how Enterprise Management structures responded to the challenge to provide more and better decision making capabilities to stay competitive in the modern globalised market. The twentieth century, also known as the century of speed, saw a paradoxical move to an integrated view of the Enterprise where the notion of a full business view on a single computer screen, became the norm driving organisational technology evolution. The age of globalisation drove this requirement further with the need for more and better information quicker and more reliable, following the trends of an integrated world (Rashid 2006).

The term ERP (Enterprise Resource Planning) system and the usage of these systems are common in modern business (Olhager, 2013). The value of these systems has far exceeded the individual components synonym with business operations such as procurement or financials viewed in isolation. Rashid (2006) explains that the real corporate value of these systems being embedded in the corporate integration platform provided by interwoven information, across business disciplines and integrating these areas to provide a single platform for business source data.

Olhager (2013) explains that ERP in its modern form dates to the 1960's. The advances in modern electronics created a technology evolution that enabled a complex technology platform, enigmatic to business advancement that required basic business systems to support the business value chain and at least provides a status quo on a competitive level. This paradoxical growth in technology over time equalised with business requirements slowly adjusting to a business requiring systems that could provide better information. Due to the technical restraints of the time, separate systems were being managed during this period within traditional business functions such as Manufacturing, Maintenance, Procurement, and Financials. These systems were very often incongruent, running on separate systems and databases. Cross functional business management was complex,

independent in nature with manual updates between them. ERP systems designers had the vision to replace the silos of information by providing a platform to integrate business functions, thereby closing the digital divide

Rashid (2006) argues a journey of this nature from a predominant manual system in the early 1960's into a world of modern technology and computerised systems has been complex for many an organisation. This rapid transition occurred in 30 years, implying a generational impact on corporate business. Driving the modern ERP system is a combination of business modules where a module represents a business component (such as finance or procurement) that in turn is strung together to build a business process. If data is entered in one module, such as procurement, data is automatically updated in related areas such as inventory and financials. The power of this process is the integrated nature of information flowing in real time. Since data needs to be entered a single-entry point, the need for multiple entries of the same information is no longer required. The effect is increased productivity, fewer mistakes and more accurate information.

1.2 Motivation for the Study

As a Program- and Project manager responsible implementing ERP systems, the measure of project success is a complex issue. A project might very well be delivered on time, within budget and according to design scope, but reality very often is that business in one or many levels of the organisation structure might see the project as a failure, be it in the practical applications of the delivered system or even due a lack of the clear understanding of the executive deliverables built around project delivery. The opposite might also be a factor to consider, in the scenario where the Implementation team might consider a project to be on budget on time and within the overall scope of the project but failed to be seen as a delivered or perceived success.

A common perception in the business world is that ERP projects generally fail. The 2016 Harvey Nash/KPMG CIO Survey (2016) suggested that as many as 62% of ERP projects fail. This high level of perception of failure by business leaders is a strong warning sign that there are still unresolved problems in the roll out of modern ERP systems.

Information technology in its simplest form has become part of every business and in many cases even the driving force behind the Value Chain. Business applications such as Spreadsheets, Word processing, and database design have become commodity skills with an

expected working knowledge of these a basic business assumption of the skillset of the average manager.

However, when the concept of ERP systems such as SAP or Oracle is mentioned, the response is either that of fear and failure or of real tangible value adding. Perhaps the complexity of an ERP system is that the integration into business operations is so significant that a natural tendency is to perceive these systems as an intrusion of the workplace and an instrument to make human resources redundant. As a counter argument, with the explosion of information requirements both as statutory requirements and as drivers of a competitive advantage, business has no choice but to engage this beast.

Why then 30 years into ERP systems being first introduced are these systems in many cases still viewed as high risk projects, with a high probability of failure and overspending? Is there a fundamental flaw in the implementation process of these systems or is there a deeper underlying cause that could be identified as a fundamental requirement to deliver a project successfully. If the implementation procedures designed over time are deemed to be appropriate to success, is there a common cause that could be identified as fundamental or even detrimental to project success as is seen from the different levels of business users.

1.3 Focus and Rationale of the Study

1.3.1 Focus of study

Due to the nature of modern business, the majority of corporate business use formally, managed ERP systems. To therefor manage the scope of the research, the research is restricted to ERP projects in South Africa in KwaZulu-Natal (KZN) and Gauteng, with a focus on logistics and manufacturing entities. The Implementations were SAP focused as the leading large ERP provider in the region. The prerequisite being, the projects were managed using modern Implementation Methodologies such as SAP's ASAP methodology, where the projects were completed on time and within budget, with a defined project scope. The scope was defined, due to the nature and composition of the employees affected by ERP systems. On the one side, highly qualified executives, on the other side of the scale, employees that are in many cases operators of machines or drivers, with a relatively low level of educational. The scope of an ERP implementation in this type of business is wide and would require an implementation methodology to cater for the full scope of business, including aspects that

can be omitted in other industries, such as process training, basis navigational skills training and effective end user communication.

1.3.2 Rationale

With the evolution in business system technology and key business challenges such as globalization and the increasing pressure to have global information available, there is significant pressure on business to implement Business Systems to support the value chain. However, there is a perception that these projects in many cases are not delivered successfully. The aim of the research is to review the South African Logistics Supply Chain and Manufacturing environment and review the measurements and even perceptions of success in business projects ERP projects. The results then may identify the shortcomings in project implementation methodologies to address these perceived failures. One of the key observations in initial research indicates that a project might be technically successful but from a business point of view be a complete failure. The rationale being that even project success is subjective in analysing complex business systems (ERP and ERP II) projects.

1.4 Problem Statement

Within the view of the ERP Programme / Project manager, the success of ERP projects are key performance drivers. Despite established software implementation methodologies, there still is a perception in the market that these large projects tend to fail. The question is what needs be done to change ERP implementation methodologies to be practical in a South Africa business environment and what management constraints affect large implementation projects that are not addressed by these methodologies?

Atkinson (2013, kindle 71) estimates as much as 70% of ERP projects fail in their goals to deliver the anticipated value. This perception in daily operations causes a significant barrier to system acceptance, usage, and utilisation. Why is this perception still so prevalent and what is the main reason for this perception within the South African ERP market? Why in this age of globalisation, technology advances such as “the Internet of things” and “Big Data” are we still constrained by core business systems that do not perform or are implemented at a standard that the business user can accept and perceive as successful?

Information Technology in its simplest form has become part of every business and in many cases, is the driving force behind the modern Value Chain. However, when the concept of

ERP systems such as SAP or Oracle is mentioned, the response is either that of fear and failure or that of real value adding. Failure is in many cases associated with stigmas of failed ERP implementations that have even had significant impacts on business. As a key consideration, the concept of the complexity of ERP Implementations. The power and complexity of an ERP system is that the touch points into business operations are so tightly integrated that there is a natural tendency to perceive the system as an intrusion of the workplace and an instrument to make human resources redundant. This fear of being replaced by a system or not making the transition into an ERP work environment could very easily be interpreted as project failure and is a direct function of the organisational readiness to implement an ERP system. (Jiwat, et al., 2015) As a counter argument, with the explosion of information requirements both as statutory requirements and as drivers of a competitive advantage, business has no choice but to engage Technology.

Why then 30 years into ERP systems being first introduced, are these systems in many cases still viewed as high risk projects, with a high probability of failure and overspending. Is there a fundamental flaw in the implementation process of these systems or is there a deeper underlying cause that could be identified as a fundamental requirement to deliver a project successfully? If the implementation procedures designed over time are deemed to be appropriate to success, is there a common cause that could be identified as fundamental or even detrimental to project success as is seen from the different levels of business users in the South African manufacturing and logistics ERP environments?

To review project implementation methodology, the implementation process suggested by leading ERP Software (SAP) in South Africa is used as a base for the evaluation and extension of the traditional ERP software implementation models. This would imply analysing the project phases and unpacking the implementation logic. In addition, a review of the supporting process of the project is reviewed that would include change management, corporate leadership, consultant skill level and project management.

By reviewing the project implementation as a subset of interdependent processes the aim of the research would be to identify generic project shortcomings in projects where research respondents have indicated some degree of project failure.

1.5 Research Sub-Questions

During the Study the following Sub- questions need to be answered in support of the main problem statement:

- Was the ERP implementation perceived as successful?
- Definition of Project success- What would serve as a definition for project success?
- What shortcomings could be identified in the process used to implement the ERP systems?
- What changes can be made to traditional implementation methodologies for ERP systems in the context of the study (South Africa)
- Training- Is there a clear indication of how to perform training. Examples include classroom training and electronic learning. Related is there an impact on success if the training was done before go-live or as a post go-live action (on the job training)?
- Stakeholder management – Effective stakeholder management through the duration of the implementation life cycle is seen as a tool to manage project scope. But does it really add to project success?

1.6 Objectives of the research

The results from the survey should support these objectives, either as input to the answering of these or to support research:

- Identify a definition for ERP Project Success/ Failure
- Identify perceptions of successful and unsuccessful ERP projects, in South Africa in KwaZulu-Natal and Gauteng within the research domain and why failure was reported, even when following modern implementation methodology.
- Consolidate the alternative views of project success with a definition of project success.
- Identify Key areas of improvement to address these shortcomings, such as training, communication and Stakeholder management
- Review standard project methodologies with shortcomings and suggest improvements and further research.
- Identify the role and impact of stakeholders through the project lifecycle

1.7 Limitations of the study

The approach is limited to three target groups in ERP projects:

- The ERP consultant (the technical specialist) usually implementing the project
- The business project enablers. Working with the consultant they prepare the system with the consultant, provide business leadership and manage operational project transition
- Business stakeholder. This includes all those involved in the project, be it directly or indirectly as a key target of the implemented project. In essence, those who would experience the effect of the completed project.

Quantitative research was selected for the research. The assumption being that by a focused questionnaire, information about all three groups could be accumulated and different responses per question could be obtained to clarify the feedback. The feedback was then analysed to identify reasons in this industry for project failure and a platform can be established to adjust implementation methodologies to correct these.

The sample was limited to project that were perceived to be successful by the project governance bodies. This enabled a baseline to compare project member responses against. Geographically the population was also limited to have a uniform base of comparison. Within these parameters the population was estimated at 800, with a sample size of 200. The population was estimated as an average number of active participants in an ERP project per selected business.

1.8 Chapter Summary

Modern ERP projects are complex by nature and usually require large capital outlay. In order to successfully implement these projects, implementation methodologies are utilised to link stakeholders, technical teams, and end users together in achieving the goal of a successful project. The aim of this study is to identify where these components do not align either due to mismanagement or components of each sub category not delivered either due to an omission or by incorrectly applying the project methodology.

By limiting the scope of the research to KwaZulu-Natal and Gauteng, an understanding of the view of the entire spectrum of project stakeholders are obtained and evaluated. The secondary limitations include the projects being implemented utilising modern supplier

based implementation methodologies and ensuring the projects were confirmed to be completed on time and within budget, the focus of the research moves to individual participants to the project and their experiences of the project in their own scope of focus in the organisation. By understanding the rational of these stakeholders post project implementation, the study aims to understand and suggest potential corrections to how a project of this nature should be approached.

Chapter Two

Literature Review

2.1 Introduction

The literature review focuses firstly on an understanding of the evolution of ERP. Where does the concept come from and how has the ERP system deployed in most modern organisations evolved to the point of a fully integrated business system that manages the operations in an entire business, from finance to procurement to human resources. Following an understanding of the evolution of ERP systems, a thematic review of the project management and implementation methodologies used in projects is done to illustrate the adaptation of these methodologies to align to modern ERP systems. This includes concepts such as risk management, training change, project governance and the role of the Program Office.

2.2 The evolution of Enterprise Resource Planning (ERP)

ERP, as it is known today, has a long history dating back to the 1960's. Material requirements planning (MRP) was primarily developed for the manufacturing industry (Atkinson, 2013) and introduced a revolution in manufacturing as the calculations moved from minimum maximum stock level management to integrated stock planning. As manufacturing evolved in the methods of planning by the introduction of new concepts such as capacity planning, the evolution of the MRP system continued, expanding into the areas of Sales and Procurement information Management in the 1970's. The core restraint was that these concepts remained mostly theoretical as the computing power to manage these were just not available (McGaughey, 2011). The concept was rebranded as MRPII where the acronym now presented Manufacturing Resource Planning or "closed loop production cycles", implying iterations of calculations with larger data ranges. As technology developed, the use of these systems expanded to include other business activities such as financials. Even at this early stage user of these principles were seen as a computer system approach where users no longer needed to understand the core principles of the calculations behind these principles (Atkinson, 2013).

By the 1990's technology was supporting these systems and these increasingly more sophisticated systems were rebranded as Enterprise Resource planning systems or ERP systems (McGaughey, 2011). As technology evolved since the 1990's, supported by the year 2000 systems scare (Y2K) this world had evolved into an array of integrated systems, that range from Customer relation management(CRM) systems to Supply chain management systems (SCM) on the other spectrum, all built on integrated systems platforms that attempt to link Business strategy, operations and Intelligence in a unified way to support the business value chain and ultimately "capturing, modelling and decision making" (McGaughey, 2011, pp. 22-23).

On the other spectrum, an evolving business environment, requires a constantly evolving Business Systems environment and ultimately a comprehensive environment beyond the scope of the traditional view of an ERP system. Koh et al. (2011, p386) introduces the next level of ERP systems as an ERP II system with a focus on "inter-organisational collaboration", fundamentally a fully integrated approach to harnessing the evolution of independently developed business applications as an extension of the core ERP system, rather than individual partially integrated systems. Figure 1 describes the common understanding of an ERP system as explained over time. The evolution of ERP into ERP II involves a static where a core silo concept is evolved to a modular design, that is web and cloud based and initiates a concept of full collaboration across the supply chain, extending into financials. Figure 1.1 and Figure 1.2. Illustrates this progression



Figure 1.1 ERP as a core model adapted from Koh, et al., 2011, p386

Figure 1.1 demonstrates the traditional view of ERP systems as project implementation methodologies were designed on as a base. The modular concept is the key driver, where standalone modules such as Accounting is integrated into other ERP units such as Inventory. This approach is a key driver to managing the organisation, with the constraint that the technology is inward focused. The evolution of technology allows for the alignment to move into a more complex level of alignment to business and external parties.



Figure 1.2 ERP II as a core model adapted from Koh, et al., 2011, p386

Figure 1.2 illustrates this externally integrated environment where the core ERP system is consolidated within process streams rather than the traditional silo or module view and externally aligned utilising external data sources to manage the organisation. With this external view, the complexity and impact of the project implementation add dimensions of stakeholders to the project environment that need to be considered as part of the larger business impact. Koh, Gunasekaran and Goodman. (2011, p387) defines this complexity as two fold,” On the one side the complexity of technology and the related technological infrastructure of complex systems and secondly the business issues facing corporate expansion.” The later consisting of “soft issues” related to the complexities of “managing people, organisational inertia, and change management. Due to the complex nature of ERP II expanding boundaries, managing the complexities of the changing organisation is in many cases more complex than the technological underpinning of such projects.” The Inverse is of course also applicable. With ERP consultants trying to keep up with technology the related skills are not always present to translate business requirements into ERP specifications. The dilemma supports the question if consultant skills throughout the project life cycle could affect project success.

Baltzan (2012, p316) summarises the impact of systematics failure that supports this complexity “if one application would perform poorly, the entire customer value system is

affected. By implication the entire value chain is at risk should a component fail.” Relating this comment to ERP systems would suggest that inter modular / process integration is ultimately the aim of a good ERP implementation methodology.

2.3 Project Management and the Software Implementation cycle.

The technical and business issues facing modern projects implies that implementing these types of projects would require a management role and defined processes to facilitate implementation. This facilitation is typically managed with a formalised implementation methodology to plan, structure, and control the process (Dunaway, 2015).

A global body, the Project management Institute, created a governance framework on the definition and management of projects PMBOK (2013, p6). The Institute publishes a guide to project management, referred to the “Project Management Book of Knowledge.” The publication is cited in many sources as a primary guide for information.

A core definition is the positioning of a project within the larger organisation. Burke (2013,29). PMBOK (2013, p 5) defines a project as “a temporary, structured activity, undertaken to create a specific product or outcome. The activity has a defined end date and has unique identified activities that differentiate it from other projects.”

He defines criteria for a project, beyond the defined start and end date, to have as:

- “Lifecycle- implying a number of phases to pass through to completions such as design and handover;
- Schedules and timelines to support the defined start and end dates
- Budget as a cost driver and measure
- Be non-repetitive implying that activities are unique
- Resources – coordination of people and equipment from different internal and external parties to the business
- Single point of responsibility, usually the project manager
- The team, usually multidiscipline teams that are formed to implement the project.”

Based on the nature of a project, PMBOK, (2013, p38) defines the requirements for a project to be successful as:

- “Select appropriate processes required to meet the project objectives,
- Use a defined approach that can be adopted to meet requirements,
- Comply with requirements to meet stakeholder needs and expectations, and
- Balance the competing demands of scope, time, cost, quality, resources, and risk to produce the specified product, service, or result.”

Burke (2013, p.30) then, quoting the PMBOK, defines project management as “the application of knowledge, skills, tools and techniques to project activities to meet stakeholders needs and expectations from a project”. With the discipline of leading the project, the function has developed over years to become a ‘business transformation project’ rather than an Implementation project. (Atkinson, 2013) The impact of this role is significant as it challenges the traditional views on Project management by (PMBOK, 2008, p6) that view the project manager as the applicator of “knowledge, Skills, and techniques to project activities to meet project requirements.” On the one hand a technical role, with a clear focus on project deliverables and on the complete another side a role of leadership associated with business transformation during the journey of the project.

The added complexity is that as business and technology evolve the role of the project manager is also evolving to a completely opposite approach that the traditional PMBOK entrenched into the role definition of the project manager. The result is a evolving environment that requires an evolving approach to Implementation methodologies (Atkinson, 2013).

Over time the traditional approach to project management within the realm of software development and deployment had evolved into defined software development cycles or methodologies. One example of such a methodology is explained by Boyd (2014) in defining a Project Life Cycle as “a systematic way to get from the beginning to the end of the project.” Boyd (2014) defines the complex integrated methodologies in 5 phases of a project, all linked together by the concept of the management of time, budget, and scope as the key to project management:

- Initiation – what is the scope of the project and what deliverables are linked to cost and risk management.
- Planning - resource and costs planning and balancing the resource load, while managing deliverables.
- Executing - how the project is to be delivered, delivering results and testing linked to a project review process.
- Closing – a review of completion and consensus on closure with learnings from the project.
- Monitoring & Control – system post go live measurements and controls.

Ultimately control and success is managed across the project life cycle and measured at a baseline set at the planning level, rather than at a section or unit level.

Pearlson & Saunders (2013, p. 305) expands the view in terms of the typical IT structure as follows:

- The project starts with an Initiation and Feasibility component. The key objective is to initiate the project and make sure that the Information Management team and Users / Customers are clear on the project with a clear roadmap and a Business Case.
- This is followed by a Requirements definition phase where the system requirements are listed and documented. This would include Training and user test planning, solution identification and problem and risk identification.
- Once completed the requirements are clear and the system is designed in terms of functionality, including data and system flow designs and Implementation strategy
- Once the design is completed the system is built on the technology platform. This function includes the system and consulting procurement activities, system alignment and configuration, system integration and actual system implementation.
- When the system is then implemented, the result is verified and confirmed to identify alignment to customer specifications. This would include user testing, application and user security and training.
- Once the verification that includes system testing is completed, the system is taken live as an operational ERP system.
- The last component is the management and maintenance of the system post go live, in the run and support environment. This would include support, project closure, and a support baseline.

Developing the implementation project life cycle one step further, Ajam (2013), defines the project life cycle from the different views of the Project Owner and the Service Provider, introducing an integrated change approach and ownership of the system through the project life cycle. This view extends the scope of the implementation methodology to the point where the initiation of the project is an extension of the project life cycle. There is a clear handover between the Project Owner who initiates and originates the project to the Service provider responsible for the project delivery. The focus changes to an ownership methodology rather than an implementation methodology. The methodology introduces a secondary level of stakeholder engagement where the project initiation becomes a driver of success rather than an abstract measurement which included the overall project/product and management of the project as measures of project success. Key components of the methodology are the use of extensive planning phases and a clear project handover and closing phase.

The methodology can be summarised as follows:

- Concept or Feasibility phase where the project is initiated and designed. (Ownership is with the Business)
- A project management planning phase where the project is defined and planned on a high level (Ownership is handed over to the Service Provider and in many cases, a tender is awarded to deliver the project)
- A detail planning leg that defines a comprehensive list of activities to be performed during the project with planning detail
- An Implementation leg that would be seen as the building and testing of the project
- Finally an operational or go live phase where the project is taken into operations and then closed off.

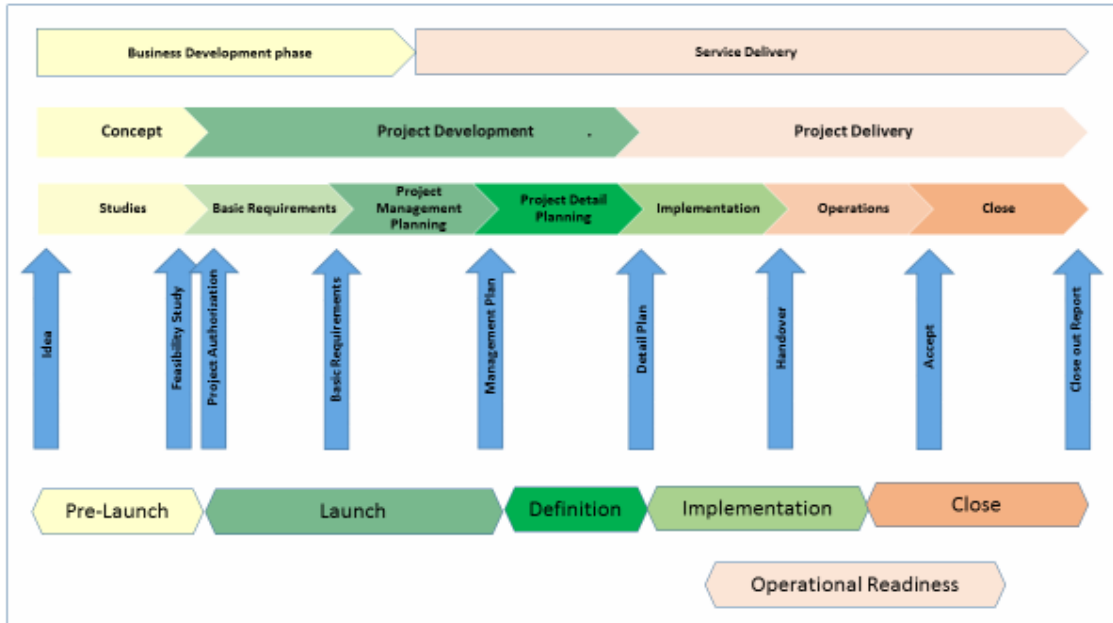


Figure 1.3 Project Management life cycle, Adapted from Ajam p26

As per Figure 1.3, the core differentiator being the concept of ownership is managed across the project life cycle and into the product life cycle. A secondary concept is that even though the Project Manager or Service Provider delivers the overall view is that the Project Owners' success is still an overall picture. Related is the concept of project control (Scope Management) and control is linked to the different stages of ownership rather than to the baseline.

The methodology goes further and discusses the definitions of the success of each component of the project.

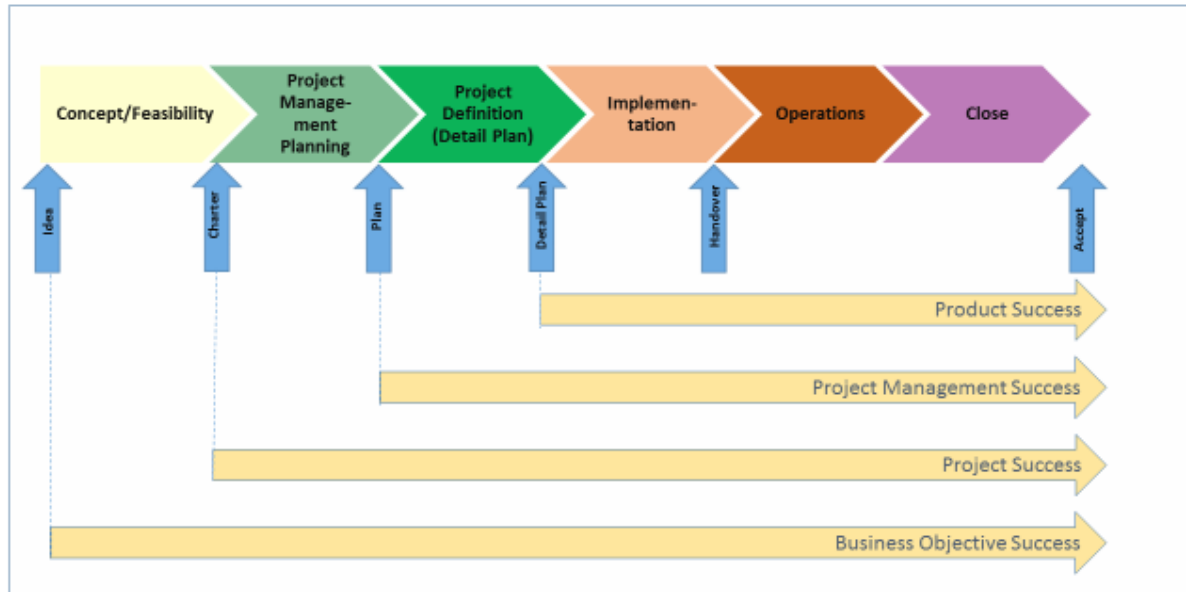


Figure 1.4 Project Success measure through the project life cycle. Adapted from Ajam p36

Ajam (2016) Defines overall success as follows in Figure 1.4:

- *Product Delivery Success:* During this component of the project, success is derived by how successful the product was delivered, with reference to plan and specifications. The client (or project owner) determines the success of the product in conjunction with the project management team. The measurement dimension is purely quality and scope and is done as the final product acceptance. Notably, the cost of the project is not included.
- *Project Management Success:* The measurement reviews project delivery and deployment as compared to the project plan. The drivers, in this case, being predominantly time and cost. Were project standards achieved and performance measures adhered to, such as governance? The client (or project owner) determines the success of the product in conjunction with the project management team. The measurement dimension is done against project plan and during project closure.
- *Project (Delivery) Success:* The third dimension is complex to measure if team project delivery was as per the various project plans. These would include :

- Product delivery (as opposed to project delivery) success per the project detailed plan
- Larger (Overall) project delivery per the project management plans, such as for example divisional business units deployed as part of the larger program perspective
- Ad hoc measurements as per the project design requirements, such as a cost reduction.

For this project measurement, the assessment cannot always be done at project closure and would sometimes need to happen, sometime later. The measurement, in general, is the project authorisation document (such as a Project initiation document or a project charter)

- *Business Objective Success:* The measurement reviews the project objective (business reason) success. The measure assesses the project delivery of the expected benefits that were outlined as the idea statement, business case or concept approval. In some cases, the measure might be similar to Project Delivery success, but it could be more complex, such as a longer-term Return on Investment (ROI). The contrast being that project delivery is measured against the project scoping document (or charter or PAD) where this measure ties back to the original motivation of the project, in many cases a Business Case.

This model provides a good base for projects, however the model is focused on technical deliverables in isolation to business requirements and the larger impact of projects on business.

2.4 Evolutional approaches to large scale ERP projects

Block et al. (2012) state in their research in conjunction with the University of Oxford that projects very often exceed budget (45% of projects), time (7% of projects) while 56% delivering a lower than expected result. The result is also consistent across industries. This supports the view that potentially there are shortcomings in the approach of managing projects in terms of delivery.

The suggestion by Block et al. (2012) indicates four areas to focus to on as drivers of project delivery rather than the traditional strong reliance on the technical skillset brought to the project as the primary driver of the delivery of the project:

- Firstly, a focus shift from budgetary and time considerations to corporate strategy and stakeholder management. By creating a clear view of strategic importance and value of the deliverables, the focus moves away from the technical content. By then driving the business case (in support of the business strategic initiatives) along with a timeline associated with the strategic vision, by implication a project timeline is reinforced. This approach potentially is then taken further by aligning stakeholders such as vendors, executives, partners and regulatory parties (such as Audit functions) to the strategic intentions of the projects, rather than a focus only on technical deliverables.
- A second focus is to increase the technology advantage and project content quality by securing critical internal and external resources to enrich the project's quality. By drawing on high levels of talent the project team is able to perform on a higher level, thereby increasing the quality of deliverables. By utilising strong resources from both the business and subject experts, a balance is established between the business and technical deliverables with a direct relationship to improving the delivered quality of the project.
- A third approach is to focus on building effective team structures by aligning project is to align per individual work stream. By changing this silo approach to a team approach on a project level, the delivery of the individual is linked to the project delivery goals rather than line managed performance models. By aligning incentives in this way, there are other incentives that become visible as increased performance such as improved communication of the project stream member to line structure as project success becomes a driver for personal reward.
- The fourth suggestion is to focus on the quality of project management. This implies modern approaches such as short delivery cycles (rapid deployments and agile project management) aligned with controlled quality checking throughout the process. By aligning the project and programme office to strategic initiatives. By adding rigid project controls such as technical and change request management and stage gate management, controls are put in place to manage the discipline required

to align to time and budget constraints. In conjunction with controls, the focus needs to be on short delivery cycles to minimise waste in development cycles.

Reviewing the above the real value is derived by aligning these principles to the implementation approach in the table below.

Table 2.1 Value Assurance table. Adapted from (Bloch M, Blumberg S, Laartz J, 2012)

| Categories: | Strategy and Stakeholders | Technology and content | Teams and Capabilities | Project Management |
|----------------------------|--|--|---|---|
| <i>Project Enrichment:</i> | Clear project objectives | Proven Software and standardised approach | Strong project management | Reliable timelines and plans |
| | Alignment of Major stakeholders | User involvement to define solutions | Strong and focused project team | Defined, established methodology and tools |
| | Simple fixed project scope | | Balance between business and technical resources | |
| | Set contracts and responsibilities with vendors | | | |
| | Strong executive support | | | |

Table 2.1 is based on the suggested success factors incorporated into the project approach/methodology and summarises the different categories of focus within the broader project approach, with the key focus areas as components of the larger project implementation methodology. Each category presents a subcomponent of the most common implementation methodologies that potentially can be an area of focused improvement within the generic software deployment cycle.

The approach attempts to align Business, Project Management and the Technical Management of the project as integrated building blocks that that construct the impetus of a

holistic approach in terms of scope, cost and time management as project drivers and offers a good baseline for a continuous improvement process for project implementation methodologies.

2.5 Modern ERP Software Implementation Methodologies

Over time the implementation methodologies have matured, considering the concepts as illustrated above in the composition of iterations of the traditional one-dimensional focus on technology as an external driver of project delivery. Based on the progression of the maturity curve of implementation approaches, fundamental project management methodologies within the realm of Information technology evolved. Business focus was based on risk management methodologies and limited unstructured change management, with very little focus on corporate strategy and stakeholder alignment, thereby establishing this paradoxical focused approach with a heavy reliance on the technology experts understanding of the business requirements, very often in isolation of stakeholders as the research from Bloch et al. (2012) indicated.

One of the leading approaches is that of the implementation methodology of SAP, as leading developer of ERP and business software, adapted their ASAP methodology over time in parallel to the evolution of modern IT project management. The research will focus on this baseline as a key market leader.

2.6 ERP Focused Project Management Approach – SAP ASAP

Leading ERP software provider SAP has over time developed an implementation methodology, based on guidelines such as PMBOK to address the shortcomings of general implementation methodologies that provide a framework rather than a deployable solution (SAP AG, 2011). The methodology is known as Accelerated SAP or ASAP. Over time, the methodology evolved to a practical approach to ERP systems that involve all aspects of a project. SAP (2011) defines the main process streams in an ERP project as Project Management, Organisation change management, Training, data management, Business process management, Technical solution management and finally Solution management. These streams in many cases run parallel to each other.

The principle of the methodology being a dedicated management stream of all aspects of the project, rather than the traditional approach of focusing on the technical solution in isolation to the business changes required. By combining all aspects of the Business in Project mode, the methodology provides a fully integrated approach to managing projects.

The methodology aims to streamline the implementation of the ERP Project, reduce overall project incidents, risks and controls the cost of the implementation with a holistic approach. By utilizing a disciplined approach and structure to the project, the focus of the project is at overall approach to reach the end goals of the project.

By utilizing a structured approach, ASAP allows for:

- Decrease Implementation timelines due to focused, streamlined approach aligned to corporate strategy, controlled by corporate governance.
- Higher quality project deliverables by utilizing a proven methodology, with technical accelerators for quicker system setup and delivered best practices
- Lower risk due to a broader view of the business and project environment aligned to stakeholder expectations rather than a supplier / Consultant view in isolation
- Improved resource usage due to a structured approach with structured timelines. This practically implies that resources are planned and engaged when needed rather than being idle with unstructured deliverables
- Overall cost reduction due to a focused approach, by managing resources by way of a structured controlled plan
- Effective project management, aligned to the Project Management Institute standards, utilising the best of modern project management practises.

2.7 ASAP Software Implementation Methodology as an approach to ERP projects

The ASAP methodology delivers the project in multiple phases or gates (SAP AG , 2011). Within each gate, there are a several processes that define the deliverables per gate. These include key business processes in parallel to technical project delivery that include change management, training, data management, communication, stakeholder management and internal governance. SAP (2011) define the following phases are included in the ASAP methodology: Project Preparation, Business Blueprinting, Project Realisation, Final preparation, Go-live and Support and Run.

Kalaimani (2016), explains the breakdown of each phase:

Phase 1: Project preparation

In the project preparation phase, the project team defines project goals, a high-level scope, and a project plan. Executive sponsorship is secured, and the project standards and organization are set up. The implementation strategy is defined and approved. At the same time, the project procedures, standards, organization, and staffing are finalized. Roles and responsibilities of the entire project team are agreed upon and documented. The objectives of the project are validated, and all initiation activities are documented in the project charter.

This phase is about information and resources. The phase is the foundation for the ERP implementation by providing a platform to structure the project build, including:

- Building senior-level management/stakeholder support. This would include senior management and key stakeholders that can assist in making decisions.
- Identifying project goals and objectives that are clear and attainable, with consideration of resources
- Creating the platform for process mapping for a future state (to-be model) and change /people integration to build a project structure and team

A key component of this phase of the project is building senior management support of the project/programme. This would include senior management and key stakeholders that can assist in making decisions.

Phase 2. Business Blueprinting

During this phase, the solution and technical designs are documented, led by subject matter experts and process specialists in the form of workshops to achieve a future state for delivery by the project. This process is supported by utilizing best practices and industry standards in conjunction to future business process and supporting key strategic advantages in the value chain.

Objectives during this phase would include:

- Business Requirements- in terms of what Business require from the system based on workshops and stakeholder input.
- Business Process Design- Process value stream mapping and the identification of specific business scenarios that need to be included in the system design.
- Solution Design (including a fit gap analysis)- the core of the process to define the plan for what to include in the system build and what to exclude.

As per design of the process, the output is a documented future state that consolidates business processes and technical value associated with ERP systems that structure the ERP system build.

Phase 3. Realization

The phase is to configure or “set up” the system and test the building of the system in several test cycles. Initially, the baseline configuration, which represents the core business process settings, is built, tested, and confirmed. Following the baseline system set-up, the process is followed with a series of configuration and development iterations of the system implementation, with the aim to complete the build of the entire system. Once the build is completed it, is followed by a number of tests, including Unit testing (compartmental testing), Integration testing (cross functional and process testing) and finally cycles of User Acceptance testing. User acceptance testing in its nature refers to a test cycle of the ERP system, where business users test the provided system in conjunction with the technical team to ensure system performance is in line with business requirements. The system build (Configuration) is documented and made available to support staff and for a process audit. System technical developments such as reports and custom programs are completed and documented.

Important at this stage of the build is the close alignment between business process and system building. Divergence at this stage of the project becomes a key risk and is attributable to the risk of project failure. This is also a key timeline for aligning business and end users to the system with a focused skills transfer.

Objectives of this phase include:

- Establishment of the technical solution landscape with performance review on the landscape.
- Building the solution according to the Blueprint.

- Overall testing of the solution within the safety of a test environment.
- Project focus on training, change and communication deliverables
- Preparation for data migration to the new ERP system,

The phase aims to utilise the Blueprint baselines and build the ERP structure according to the plan in conjunction with testing cycles to provide confidence in the functional fit of the ERP system to business requirements.

Phase 4. Final preparation

This phase is about ensuring that the pre-work is completed and all systems are functioning as per design and testing. At this stage, in theory, all design issues should be resolved with the focus on the data migration between the old and the new system. Detailed business transition and cutover plans are in place and have been communicated. End user and go live support to business is in place. At the end of this phase, the production system will be fully operational and business will continue in the new environment.

During this phase, the following activities are also completed:

- Ensuring the execution and completion of training, change and communication deliverables.
- Ensuring functional and technical support for the production system.
- Ensuring transition plans are in place, people, process, and technology.
- Data is loaded and ready for use in the new ERP system.
- Technical environments are functional and ready for live or run environment.

The ERP system is completely built and ready for end users to use the system. All data is ready to be loaded into the new system to facilitate a smooth transition to the new working platform.

Phase 5. Go-live support

This phase moves the built system in a controlled format to the live production operation. A key deliverable is the following of a well-documented cut-over process that includes moving data, static and dynamic in nature to the new system. Typical data would include financial open items, open purchase orders, account balances and assets as an example. Once data is loaded, balanced to source and audit ready, the system is made available for end user usage.

Phase 6. Run

The last phase of the project has the objective to ensure the system is now operational and practically useable. This would include the smooth running of the process, technology, and people if the project was correctly executed.

The phase typically is closed off with project closure and deliverables such as lessons learnt that aims to document key constraints during the project and how they were managed, for future projects to utilise.

Deliverables at this stage of the project include:

- Monitor the achievement of the defined and agreed to, business value and calculate the return on Investment (ROI).
- Identify actions and interventions required to ensure that business value is achieved.
- Identify additional business benefit objectives as a method to continuously improve the system quality and business reach.

At this point the project is completed and Stakeholders return to normal operations.

2.8 Unpacking the ASAP model

The next level of the model breaks down the structured gate structure to logical sub-structures as per the different project streams. As discussed earlier, ASAP defines these main process streams in an ERP implementation project as: “Project Management, Organisation change management, Training, Data management, Business process management, Technical solution management and finally Solution management.” Within these streams of delivery, there are sub-activities that need to be concluded before the next component is executed with the stream. In some cases, with a direct dependency on each other, such as data cleansing before data loading, some cases the sub- activities are associated with activities in other streams that need to run in parallel to constitute a logical execution of the ERP project. Such as training and operational data loading.

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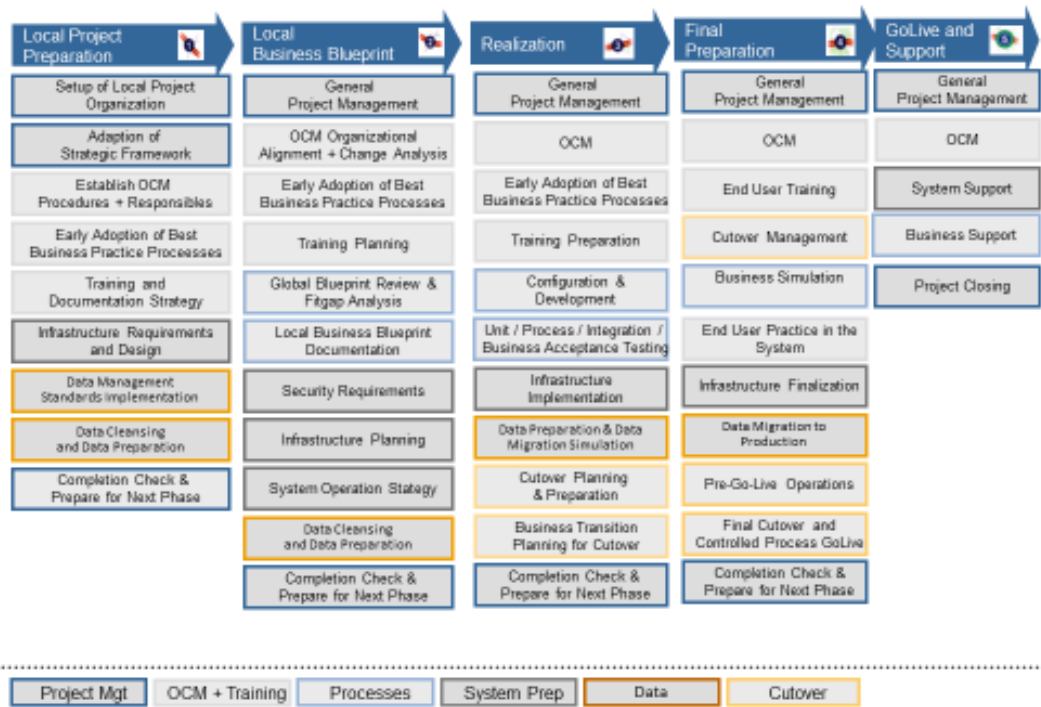


Figure 2.1 ASAP Project deliverables. Adapted from (SAP AG, 2011)

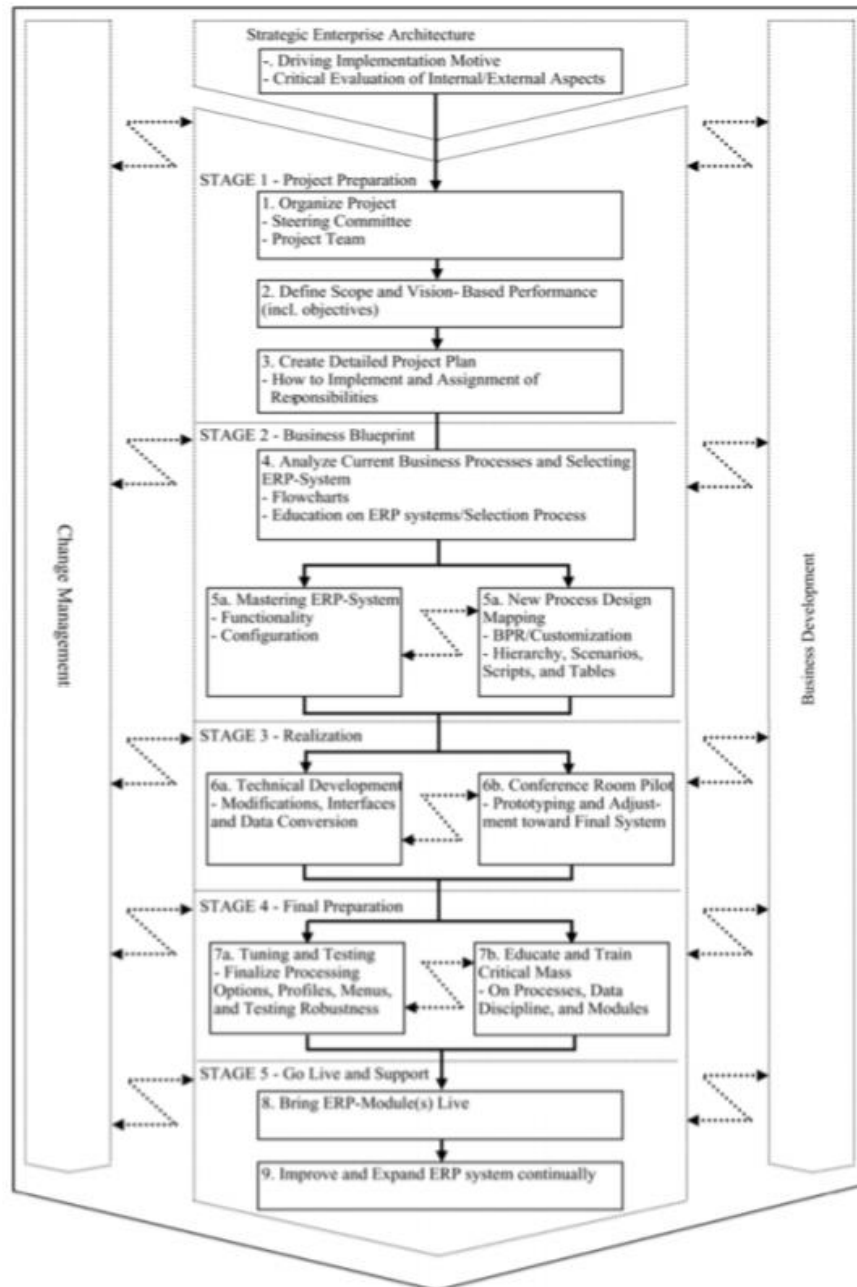


Figure 2.1 Five stage of ERP implementation process (Ehie, 2005)

Figure 5 (SAP AG, 2011) and 6 (Ehie, 2005) summarise the evolution of ERP in the time from 2005 to 2011. In 2005, the processes are defined by Ehie (2005) as a step by step recipe of system related activities that allows for the technical process to be completed in a sequential process to project completion. Concepts such as training and process mapping is a single activity in the technical stream with very little focus or build up to these processes. A related change is a parallel activity that is not part of the main stream technical system implementation steps. Business activities also continue along the side of the project with limited input into the project.

With the evolution and maturity of project implementation methodologies, the process also matured to be inclusive of business activities and create an integrated project for both business and technical project activities and to align the streams to achieve a coherent solution (SAP AG , 2011). Figure 5 displays the integrated approach of modern ERP projects and highlights the evolution silo based independent project activities to an integrated co-dependent project team with interdependent activities that are now orchestrated to run in complete harmony.

Streams build up in complexity as the project moves across the implementation, building on previous deliverables and moving each sub-process stream as an integrated subset of the larger project. As an example, business user identification to future role alignment to training.

The methodology attempts to align each process of the technical system implementation to the associated business activities that flow with the project life cycle. The challenge remains to ensure that these activities include the right stakeholders at the right time, with appropriate information gathering and sharing.

2.9 Strategy and Value within the organisation and the ERP Project

ERP projects function within the boundaries of corporate structures. To define the impact of Strategy and related Business Leadership as a driver for ERP project delivery and success, these concepts need to be defined. Pearlson & Saunders, (2013) suggest there is a correlation between Business strategy, Organisational strategy and Information Systems Strategy (The Information Systems Strategy triangle) Where business strategy presents a plan where business wants to go, IT and organisational strategy support this business strategy with people and technology strategies. The question is to understand the notion that there is a link between IT and business strategy and if project success would be a function of a clear Strategy.

Hough, et al.(2011) defines corporate strategy as “ the management plan of action to run the business and conduct operations. The core principle being that of competitive moves and approaches to business that management could deploy to grow the business, manage and attract customers in a competitive market while conducting operations and achieving the targeted levels of organisational performance. In essence performing activities in the organisation better than the competition.”

If Strategy then aims to do things better than the competition then it implies a sustainable competitive advantage over rivals is obtained when “buyers prefer its products or services above that of what the competition can offer and when the basis of this performance is maintainable.” (Hough, et al., 2011)

The conventional Enterprise Resource Planning (ERP) Project then needs to align to the ideal of doing things better than the opposition. The project requires a motivation or reason, referred to as the Business Case. A business case should indicate how the project will show a return on investment over time, and how business costs and revenue will be impacted. a different vendor to sell a company's product is an example of a business case. (businessdictionary, 2016). By increasing revenue or reducing costs, then (Hough, et al., 2011, p. 7) applies in doing things better than the competition.

Defining the business case and unpacking the detail behind the business case, requires the input of business resources that understand the business, business constraints and ultimately the corporate value achieved by the project, aligned to strategy and business objectives. The project Stakeholders form this vital integration point, aligning strategy, business objectives and value between business operations and the project.

2.10 Stakeholder Management

Project implementation methodology refers to stakeholders and understanding the concept of what a stakeholder is, the impact of stakeholders on ERP projects and how to manage the stakeholders become a key project driver.

The project Book of Knowledge initially defined the Stakeholder as “individuals and organizations that are actively involved in the project or whose interest may be affected as a result of project execution or project completion.” (PMBOK 2011, p44). As the concept of stakeholder management matured, the definition was updated to include a broader population and extends the definition to the future impact of the project and the outcome and objectives of the project. It goes further and installs the concept that project success is measured and defined by variable factors and must include different groups of stakeholders over the project life cycle.

The later edition extends the definition to “an individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of the project.” (PMBOK, 2013, p. 40)

Worsley (2016) takes the definition even further and defines a Stakeholder as: “An individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of the project . . . and are not already subject to another management process.” The definition attempts to limit the PMBOK view and exclude direct project role players such as project team members as well as governance structure project participants such as Steering Members. By narrowing the definition, Worsley allows for a focused view of stakeholders where these members can effectively be identified and managed during the project life cycle.

Worsley (2016), quotes Shenhar, Levy and Dvir (1997) in referencing ways of determining project success in relation to the management of stakeholders:

Project efficiency: The measurement compares delivery to the traditional project measures of time, scope and budget. The project charter is the baseline and stakeholder input is that of the project owner and project organisation as direct drivers of project delivery. Stakeholders in this approach to project delivery are clear are identified individuals managing the business case and scope of the project and by definition capital expenditure during the duration of the project. These stakeholders are usually directly impacted by project delivery.

Project utility: With project moving through the project live cycle into the run or operational phase, project measures move toward the practical application of the project and sustainability of the delivered project in terms of user adoption. The stakeholders at this stage potentially become larger in terms of the system users. These stakeholders might not directly impact scope or budget; however, a measure of project success must involve these users.

Project financial value: Ultimately the return on Investment, does support a notion of project success. This may not be measurable until sometime after the project was concluded technically. As with efficacy metrics, the stakeholders should include the project sponsor, but in addition, include the project investors.

Corporate or societal value: Major projects potentially leave a significant, sometimes visible reminder of project investment. This introduces much broader, more unpredictable, and very powerful stakeholder engagement.

The implication is that the concept of stakeholders is very often misunderstood in traditional projects, with stakeholders in many cases limited to those of project efficiency measures.

The result is that there potentially is a lack of understanding of the entire structure of stakeholders and ultimately a potential

From the concept of aligning strategy to the project, the key mechanism would be to attain the corporate view by engaging key stakeholders across the levels of the business (Miller & Mike, 2015). This would mean that the stakeholder is continuously engaged from project initiation to project completion, thereby aligning corporate strategy and objectives to project objectives on an ongoing basis and ultimately the scope of the project is updated to keep alignment to Corporate strategy. By engaging the stakeholder during the full project lifecycle, would ultimately improve project success. As a further step, aligning project team objectives and activities to stakeholder objectives this line is maintained and ultimately guides project deliverables and provide the project with that strategy focused approach.

The project manager needs a clear identification of the Stakeholders and ultimately align stakeholders to the project and by virtue of the alignment, ensure that Corporate and Strategy changes are fed through to project cope and delivery.

Miller & Mike, (2015) defines a 3 level stepped approach on Stakeholder management:

- “Build a Stakeholder map. This would include drawing an influence network diagram (rather than an organisational diagram), explaining levels of influence. From there create links that indicate the influencers of change and influence.
- Prioritise key Stakeholders- Clearly identifying the stakeholder, with a clear role in the project linked to a view on how to involve the view of the individual as an influencer across the project implementation cycle.
- Develop key stakeholders- Develop plans for each stakeholder in order for them to their functional position across the project implementation life cycle of the project.”

Ultimately move the stakeholder from a strategy guide through the change process to an effective end user of the system.

The approach then differs, depending on the level of the stakeholder in the organisation. Alternative change plans are required per stakeholder in order to manage the detail of change and the approach to each stakeholder according to his organisational position in the organisation and the level of influence the stakeholder holds in the organisation.

As Stakeholders then become the link between business and corporate strategy, the next activity is to incorporate Stakeholder engagement and management to project governance as

a method to add structure and focus to the project and project management, inclusive of Stakeholders.

PMBOK (2013) draws a parallel to governance A stakeholder may affect, be affected by, or have a perception of being affected by a project decision, project action or due the effect or outcome of a project. Stakeholders then may be affected in a positive or negative way by activities in the project or as a result of the project outcome. Different stakeholders may have competing expectations in the project and this in itself may create conflict. Strategic business objectives or direct requirements are embedded into the project by the guidance and direction of Stakeholders. Project governance becomes the tool to align the project to the requirements of stakeholders. Good governance becomes critical to stakeholder alignment and ultimately a guidance tool for the achievement of organizational objectives. Project governance then becomes the repeatable toolset for the modern corporate to create consistency in project delivery to optimise the value of project outcomes. Governance provides a strategic framework for the project steering team can guide the project to satisfy both stakeholder needs and expectations. Governance becomes an alignment structure between the corporate strategic objectives and the project, creating a bidirectional toolset to align business and project.

With the view of the strategic importance of Stakeholder alignment to the success of a project, an engagement model is suggested by (Worsley, 2016). Where a steering group may guide decision making in terms of project guidance and alignment to project stakeholders, this level of engagement drives decision making rather than the engagement of the stakeholder. The core message of the process of stakeholder engagement as the project moves through its lifecycle as that of an interaction between the stakeholder and the project. The process is repeated and project management utilises this process as a tool to align the project direction to that of the organisation as views by the stakeholders.

Worsley (2016) identifies a number of principles to adhere to in the engagement of project stakeholders:

- Principle 1: Stakeholders should be engaged in discussions or decisions that affect them. By not adhering to this basic principle, lack of information or consensus can have a detrimental effect on project delivery.

- Principle 2: Stakeholder inclusive participation creates the security that stakeholder input and contributions will be included in the decision-making process with clear feedback to the stakeholder on project progress.
- Principle 3: Stakeholder engagement aims to create an inclusive decision making process, by attempting to identify stakeholders that can impact the result of decision making or potentially is affected by a project decision.
- Principle 4: Stakeholder engagement attempts to positively engage stakeholders in a method to determine levels of project participation. The process is to identify how value adding by the stakeholder can be facilitated to maximise value to the project. This is potentially achieved by project management trying to associate to the business objectives of the stakeholder.
- Principle 5: Stakeholder engagement provides context, structured communication with enough detail for the stakeholder to stay informed, time to process information and to respond to situations in a constructive engaging approach and opportunity to be engaged in a meaningful way. Project management and planning need to be considerate of the stakeholder considerations in terms of a structured approach to project timelines and planning.
- Principle 6: Respect for the individual stakeholder and a positive approach to engaging the stakeholder is a final hurdle to ensure a productive unobstructed approach to managing the stakeholder engagement process.

Stakeholder management by its definition is a key component to project success. It becomes a fundamental requirement to include as a baseline project engagement model element. The constraint being to reiterate the definition to focus on stakeholders as part of the integrated process that includes parties representing all dimensions of the project. Related is the correct management of each party in the appropriate forum within the boundaries of impact and influence.

2.11 Project consultant and Business Analyst as project participants

Phillips (2013) argue that a key component of project composition is the resources that add value to the project enablement by technical skills, business processes and business needs analysis. This would include the ability to visualise, construct and enable Business processes and data requirements into the project build process. Within a project, this function is performed by project consultants in conjunction with business resources, referred to as Business Analysts. For this study, the terms project consultant and business analyst is interchangeably used.

These cross functional resources directly influence the project structure build and ultimately project success. As key components of an ERP project, the skillsets of these resources to manage and build a complex environment becomes imperative to project success. Involvement of these resources is continuous throughout the project as they are involved in the project throughout the entire project life cycle (Phillips, 2013). That would be in terms of referencing the ASAP project methodology, from Blueprint to final project commissioning (SAP AG , 2011). With this type of involvement, a natural question would be to assess the impact on these resources on project success.

Barbar, (2014) reviewed the impact of “whether and how the competencies of analysts correlate with the collection of strategic business goals.” The study focused on the question if the skillset of good business analysts would affect the strategic performance of the business in relation to goals and performance. The expected result would be that with seniority of the Business Analysts resources, larger numbers of stakeholders would be approached in understanding business requirements. The reasoning being the senior Business Analysts would possess a business understanding, understanding personal shortcomings, before applying their personal skillset in system design. The research then suggests a linear relationship between the seniority of a Business Analyst and the number of stakeholders engaged with. The result is that information gathering in a project can be attributed to the skillset of the Business Analyst, who by not engaging with a wider audience does not understand the complexities of the business requirements.

Further research (Babar, 2014) indicated, the more senior Business Analyst would approach senior management to clarify the organizational strategic directions. In contrast, the more junior or intermediate Business Analysts would mainly approach directly accessible operational staff and middle management for function design requirements. The approach

confirms that the junior analyst would not receive the same context to business constraints than their senior counterpart.

As a secondary concept, the research also indicated that senior management needs to be engaged in strategic information gathering for a project to design to be holistic. This underlines the concepts of stakeholder engagement and understanding the different levels of stakeholders in the organisation for multiple independent streams of information. This then supports the notion why there is a perception of failure of ERP projects in that implementation methodologies do not effectively encapsulate the business requirements models. The result being that projects do not identify and capture strategic goals and initiatives driven by the vision and mission of an organization's executive teams.

This research substantiates the notation of the skillset of Business Analysts as contributing to project success. The quality, experience and skill level of Business Analysts and their consulting counterparts potentially can change the direction and the quality of an ERP implementation. Further research in this environment is recommended to identify alternative remedies for this project constraint and develop more effective methods in defining workshop and information gathering procedures to enhance the quality of project design documentation.

2.12 Governance

Corporate governance is often excluded as a contributor to the ultimate success of ERP projects. However, with a comprehensive review of the complexities involved in aligning the implementation of an ERP project to business objectives, it soon becomes clear that project governance in the modern business environment becomes an integration tool, rather than a toolset to comply with Audit requirements for adhering to project rules. The parallel to this research is evident when reviewing the modern approach to corporate management and the impact of corporate governance as an enabler of structure and growth (Cai, 2016).

The Institute of Directors in South Africa has adopted strict principles for corporate governance for listed entities in South Africa (King IV, 2016). Within the realm of corporate business, there are global challenges that threaten the sustainability of these entities in future. These include globalization in terms of global trade challenges, inequality of nations, global social dynamics and geo-political tension, large population growth trends, climate change

and the related pressure on corporates to manage their carbon footprints, radical advances in transparency, with rapid technology advances.

King IV (2016) highlights the dilemma of the South African corporate environment where these challenges are further complicated with dynamics such as aging infrastructure, service delivery constraints, political tension and skills shortages. To manage these constraints leadership is key to maintain a sustainable business environment. With leadership comes structure in terms of governance. These two components being completely interdependent and cannot function effectively in isolation and relevant to the situation. King III and now King IV were drafted in this context of global corporate pressure with organizations having to compete and contend with ever advancing dynamics in an ever-evolving environment with a view on good structured corporate governance.

King IV (2016, p45) envisions good corporate governance by taking a strong approach to ethical and effective leadership by the governing body of the organisation. It defines the leadership requirement as:

- Providing organizational strategic direction with a strong emphasis on strategic management.
- Managing the required policies to implement strategy
- Reviewing and management of the implementation and performance of the corporate strategy
- Disclosure principles as is required to manage the business ethically. This would include reporting and the disclosure of information to Stakeholders.

The expected governance structures then as a result of the leadership approach could include:

- A corporate culture of ethical behaviour.
- Creation of corporate value and performance sustainability
- Corporate controls that manage the business effectively and adequately, by the governing body
- Building the reputation, legitimacy, and trust of the business and protecting the organisation

Stakeholders become a key focus of the King IV governance process and state that there is a balancing requirement between the “legitimate and reasonable needs, interests and expectations” of material stakeholders within the business. This balancing of holistic requirements become management functions of the governing body. The focus being that decision-making should at all times be for the better of the larger organisation rather than circumstances at the time (King IV, 2016, p. 50). It becomes imperative that structured management of stakeholders then becomes a managed component in business engagement rather than informal interaction.

Stakeholder alignment to corporate decision making and strategy then would add a dimension of exposing the organisation to risk in terms of unstructured stakeholder input into corporate decision making. King IV (2016, p. 52) addresses this constraint of risk governance by suggesting that risk management occurs within the framework of supporting the organisation in defining and formulating the purpose of the business activities and the achievement of strategic objectives. This responsibility is assigned to the governing structures of the business in the exposure of business to risk taking and the management of risk and opportunities.

King IV then aims to align strategy, risk and Stakeholder management as dimensions of corporate governance. The view then that corporate governance drives structure and corporate business integration and transformation, implies that Information technology and for the scope of this research, Enterprise Resource implementation projects cannot be excluded from the structures of corporate governance. King IV views Technology and Information governance as a consolidated support structure and defines the management structure as the governance of technology and information by the governing body in such a way that corporate strategic objectives are supported and the core purpose of the support function is set.

Similar to the management of Risk and Stakeholders, the governing body takes ownership to steer information management and technology in achieving strategic objectives, providing direction of the use of technology and information and guide the adoption and use of the function. (King IV, 2016, p. 53) The governance goes further and suggests the management of information management and technology in:

- Utilization and exploiting of opportunities
- Ethical and responsible use of technology

- Integration role of people, processes, and technology for managing the value chain
- Accessing a return on investment in on capital project expenditure
- Management of risk of outsourced services and the supply chain for the procurement of goods and services.
- Creation and enhancement of intellectual Information and technology capital within the organisation
- Compliance with local and international legislation.
- Risk management of electronic and cyber threats to the organisation
- Disclosure of relevant structures and procedures where required

The implication of governance on an ERP project becomes a key business control responsibility aligned to the organisation objectives and effectively becomes a responsibility of the governance body of the organisation. The impact on ERP Project Implementations then relates to adherence to corporate structures and the structured alignment to corporate strategy and objectives. The implication being that stakeholder management in conjunction with alignment to the organizational corporate governing body potentially should drive ERP projects towards stronger implementation methodologies and structure.

2.13 Project Risk Management

Project Risk management is defined by Burke (2013) as “the process concerned with the identification, analysing and responding to uncertainty.” The process starts with defining the objectives of risk management as identifying the risk, then managing the risk with appropriate mitigating actions.

De Bakker (2011) raises the notion that Project Risk Management cannot be seen as a theoretical decision making process in isolation, but it should rather be evaluated in a business environment where there is an awareness and a perception of the factors that contribute to risk. There needs to be a business understanding that there will be exceptions to the norm during the project progress and inter-personal interactions between business and the project needs to be synchronised and integrated rather than theoretically managed. In many cases, risk management will be required to manage and understand the impact of ‘softer’ business issues, introducing the notion that a project is a social object that needs to interact

with human behaviour. This risk object has a variable dynamic, rather than a static technical theoretical approach.

Kalaimani (2016) suggests a detailed risk mitigation plan to manage the associated project risk. This includes an assigned risk owner managing the risk process. The project manager should in conjunction with the management of the risk process develop a risk mitigation plan to ensure risk mitigations are managed, monitored and controlled, with frequent risk plan updates.

The process is initialised by collecting risks from the different project sources, externally to the project team. The risk is recorded, scored on a probability/effect matrix, analysed, and followed by a mitigation plan for the risk. This database of risk is enhanced by adding project risks, collected from project teams.

The scored risks are then presented to stakeholders, explaining the probability of the risk occurring and the impact on business/project should the risk not be mitigated. The risk mitigation plan then aligns responses to the listed risks in a structured format referred to as a risk management plan.

With this process, the risk is managed within the boundaries of project governance with a goal to mitigate all project risks.

This concept then suggests another component of projects. Change Management has become an increasingly complex component of projects. In many ways attempting to make sense of the merging of the two worlds of business and technology, brought together by project management.

2.14 The role of Change management

Business evolution, technology and the management of these two factors are core drivers of project success in ERP projects however, the core challenge is the ability of business users to grow with the business on the one side in parallel to system and technology changes. The question is raised if the ability of a human to change and adapt is not completely underestimated. Battleson (2013) takes the argument further by suggesting that business problems, rather than technological challenges are a bigger source of failure in projects. This is illustrated by the fact that in many project implementations, so called 'Industry Best Practices' are used as a technical guiding document for implementations while these are not

necessarily aligned with business strategy or the value chain, resulting in poor performance or even project failure

Multiple approaches are available to address Change in Projects. The most common being the model of Kotter. His famous 8 steps for leading change (Kotter, 2012) attempts to adjust to change in a structured way, thereby avoiding failure. Figure 7 explains the journey.

Nir (2013) concludes this model is well known in the change process and although it is widely used, its practical application in IT and engineering ('hard type skills') seems to be not that well known and applied. The model, in essence, suggests a people driven approach change management that enables people to see the reason for change rather than the conventional approach of a top down communication of change in one directional communication. Nir (2013) suggests that people change when they are shown the truth and that influences their feelings. Once again a very foreign concept for the traditional manufacturing/ Supply chain business in South Africa. The question arising then is whether people respond better to change if they could make sense of the core, or is this softer approach insignificant in a controlled clinical ERP implementation based on the core PMBOK principles.



Figure 2.3 The 8 step process for leading changes (Adapted from (Kotter, 2012))

Successful change will go through all of the steps above, usually in the sequence as indicated. It therefore becomes a project management task to ensure that the resources related to each

step is catered for in the project deployment. Leadership then moved beyond the understanding of classic project management to that of a definition of what the future should look like, aligning business strategy with the project and IT strategy, aligning of visionaries and making the project happen, even with project obstacles (Hornstein, 2008).

From the approach of change, there are then a number of influences that can be derived from the change approach. Hornstein (2008) lists the following questions:

- “Is there a commitment from senior management to institute a culture that supports change?”
- Is the commitment from senior management a dedicated executable on shop floor level?
- Is the organizational culture evolving to deal with the complexities of change?
- Is there an allocated budget to support change activities in the project?
- Is the focus on project management more than just a method to obtain change from a senior level, rather than a dedicated facilitation of change?
- Has change performance measures been incorporated into operational measures?
- Is there a clear change plan that addresses the change efforts faced by employees?
- Are there adequate change resources to facilitate the changing role?
- Are changes incorporated into employee and management roles?
- Are change resources included in the management of the project and their input valued?
- Is there a post go live succession plan to facilitate change?”

With large ERP projects, many organisations are effectively turned upside down. Change Management becomes the tool to align the business to the project on the one hand and the potential process changes being incorporated into the project.

2.15 Training and the Impact on Project Acceptance

Chayakonvikom, et al., (2016) explains the importance of learning in an ERP implementation. The research confirms that ineffective learning, in terms of education and training, leads to end user resistance towards the implemented ERP system. This, in turn, leads to challenging the long term benefits from an ERP system being implemented in and organisation and ultimately affects the value of the return on the investment made in the ERP system.

The research by Chayakonvikom found that the current approach generally used in ERP projects does not succeed in transferring the skills and knowledge to end users as is intended with the training. The result of the training being that end users have an incomplete conception of the training outcome with the effect that the training cannot be applied in the business environment in the post go live system. A secondary effect being that end users avoid using the system as they fear they will make mistakes, with a resultant productivity impact.

Chayakonvikom (2016) further suggests end user dissatisfaction was mapped in four areas that could create an impression of project failure. The areas are broken down into the training method, the content of the training, the training material and the duration of the training:

- The training method- How is training presented in terms of organisation, practicing and time? In the study, the reference was classroom style lecturing with inadequate time and practise being highlighted. Related is the common approach of train the trainer that does not seem as a successful approach in presenting training. As a remedy to this common approach, the research indicates relevant business scenarios and case studies with practise as an alternative to transactional training.
- The training content – the main concern being that training material is static and does not reflect the real business scenario, rather than just a list of transactions used to execute the ERP system. Further observations indicated that the training content should be wider than the focus area of the training subgroup. As an example, the material should include the wider process and the interrelationship between the different ERP modules rather than just the directly applicable process or transactional information.
- Training material used – The material should include a broader scope than the traditional approach of screen dumps and transaction codes. To support a broader training content, the larger process and scenarios should be included in the training pack.
- Training duration and allocation of training time– End user training is usually a pressured process in a short time during the latter part of an ERP implementation project. The consequence is that there is not much time for extended training sessions that include a process overview, business scenario/ case studies and enough time to practise the new found skillset. Related the training should be focused on the time before and after cutover. The time before cutover should focus on the basic skills

and standard process to be followed, while the time after the cutover should be used for extended business scenarios and slightly more complex transactional processes.

From the research, it is concluded that training contributes highly to the perception of project success and the return on the project investment. Further research is required to understand the real impact of training effectiveness in the ERP environment in South Africa and if the impact of training is as significant as indicated.

2.16 Data as a driver to project success

A key component of ERP systems is data. SAP AG (2016) define data as the corner stone of the ERP system and it is the key that drives all aspects of ERP systems. Data as a component of the implementation tasks when implementing an ERP system is key and becomes significantly more essential to project success as the project matures. Within a project, data has multiple dimensions and need to be viewed as components of an evolving system that matures in nature as a function of time. Secondly, data becomes the anchoring tool of transactional data. Master data anchors the logic of the dynamics of transactional data. By its nature, it provides the substance to define entries in a system. As an example, a thousand journal entries with no anchor of a general ledger account as master data anchor becomes meaningless. The same applies to reporting, Data becomes the paint that the artist uses to paint his reporting picture.

Two types of data components are defined in an ERP system. The first being Master data as building blocks and anchors of the database and the second component being transactional or dynamic data.

2.17 Master data as ERP building block, Supported by transactions.

As discussed, data is key to project success as a project building block. Furthermore data and the management of data is a key deliverable on an ERP implementation project. Master data is defined by Gartner (2016) as” the consistent and uniform set of identifiers and extended attributes that describe the core entities of the enterprise including customers, prospects, citizens, suppliers, sites, hierarchies and chart of accounts.”

Master data Management is defined by Gartner as a” technology-enabled discipline in which business and IT work together to ensure the uniformity, accuracy, stewardship, semantic consistency and accountability of the enterprise’s official shared master data assets.”. It

comes down to manage the control and use of master data in an integrated way within the constraints and governance in a corporate structure. This definition of Master data is expanded by (Techopedia, 2016) in that “Master data refers to data units that are non-transactional, top level and relational business entities or elements that are joinable in observable ways. An organization may use master data on more than one platform or across a variety of software programs or technology.” A technical definition of Master data is provided by (Samaranayake, 2011) in that “master data is raw data and static in nature, and is maintained, rather than posted by transactions in the ERP system database and inherently linked with related business processes through applications.” Samaranayake (2011)’s view provides a generic platform for understanding Master data in that it is a pre-defined maintained action of deciding on structures, naming and integrated applications, rather than the transactional posting of data. As an example the application of a general ledger account as a static, predefined number that is logically linked to a process, while the journal posting is the non-static component.

This definition lays the platform for modern uses of data in shared platforms in a Global economy. Examples may include the same material record for a product that is managed globally. Global Master data management is then the management of Master data across platforms across legal entities and geographical separation.

This concept is expanded further by (Legman, 2012) in the explanation that ERP Systems are built up by business structures or modules. This can include Management Accounting, Manufacturing, Sales, Procurement and Inventory, Human Resources and other related business functions. The key advantage and characteristics of modern ERP systems are the integrated nature of these modules, sharing information in terms of static Master data as an anchor, with transactional data allowing for Inter-modular data exchange. The key structures that enables this integration of business functions are the key fields or master data elements that allow structure. An example would be a Vendor number. This Vendor number allows for the collection of costs and integrates to financials. The quality of this type of Master data is a key driver for the successful implementation of an ERP system.’

Transactional Data presents the operational or business transactions in systems. These transactions are associated with relevant data inputs. Samaranayake (2011) states that transaction data is dynamic in nature and characteristics and maintain dynamic links in the database with associated master data structures. By the posting of the transactional data into

the system, the associated master data usually becomes part of the dynamic posting in order to allow for the independent management of master data structures. Once these transaction data is posted in the ERP system, any subsequent changes to master data are is not updated in the transaction data structure. This dynamic interaction between Static or Master Data and Dynamic or Transactional data is a component of the Project Implementation dynamics and as per this integrated nature a key project deliverable.

Master data in the context of an ERP system and related successful implementation becomes a success driver as discussed by (Semarchy, 2016) :

- The data becomes the driver of operational and business analytical processes. Master data as a selection or static component and transactional data providing the variations in business activity.
- Master data becomes a common theme across the business (including geographical and legal entities) and is digitally scattered throughout the business.
- Master data provides a standard tread for business-critical data that is integrated across the Business and business structures, both vertically and horizontally and becomes a “single source of truth” and establishes a baseline for collaboration between business units and functions.

In the context of an ERP implementation project, the dynamics of data adds complexity to the process of managing data. In order to sustain complex business units, a number of defined processes support the process of managing the complexities

- Defined business procedures and processes are defined on a corporate level for maintenance of master data. By defining the process, consistency in the quality of the data is established. The structure also assists in the management of duplication.
- Data ownerships is clear, defined and documented. By owning the data in specific departments, the quality of the data is guided and managed.
- Data modification processes are clear, defined and followed by business. As a parallel function to ownership, all data changes are made in a structured way, within the boundaries of business controls and predefined data structures.

- Data modifications and changes are controlled and audited. This is done with an internal change control procedure that is recorded and presented for audit.
- Clear data migration policies are in place for a data migration between systems. That would include a structured process with auditable controls and clear responsibilities.
- Data management does not end with project implementation, it is an ongoing process, suggesting a sustainable data management approach is embedded within the implementation strategy.

In the ASAP project methodology, a clear number of steps are listed to manage the data migration process. These include:

- Data object identification – What data should be managed in a project.
- A clear data extraction and cleansing policy aligned to project timelines. That would imply a clear process of extracting data from the source data base and the cleansing of data to eliminate duplication and redundancy.
- Alignment of the data to the requirements of the ERP system to be implemented. This step aims to map data from legacy (or base system) into an existing data platform, thereby mapping data with a view to the elimination of duplicate entries
- Version controlled management. This simple process insures that the correct version of data is managed by the project team, while historical data templates are kept for reference purposes.
- Synchronized alignment to the transactional data loading into the new system is a secondary consideration as a project consideration. With a view of aligning open items in a typical go-live environment, the risk of data mismatches when taking on transactional data is eliminated.

Relating this complex matter of data being a building block for an ERP system, (White, 2013) aligns the importance of data with that of an ERP project. With the understanding that master data is key to project success as a project building block, master data management is a key deliverable on an implementation project, complexities in the management of data is becoming more common. White lists a few concerns. The first being the confusion that the concept of Master data Management and Master data Management tools are used out of context. He highlights the pitfall modern business so easily miss. A Master data

Management (MDM) hub is a system that is independently managed from the ERP system and is designed to be supportive of multiple systems and by definition, projects. Related is that the design of a Master data hub is potentially independent of the ERP system being implemented. The result being that data alignment becomes very complex in relationship to a specific project that potentially could influence project success and the perception of success. A hub or a shared data service is a core component of a project and can potentially delay a project, however, this should not be seen as a driver of the project. Instead, it should be an integrator of applications. In general terms, the master data hub becomes the key that translates data between systems, not the driver of a focused project.

This becomes a risk to projects as the definition of what the data hub should provide in a project and the resultant responsibility of the project team members become blurred. A secondary risk is that the concept of a hub starts overtaking the key functions of the ERP system and starts becoming a repository of non MDM managed data such as Bill of Materials. The project team needs to be aware of this process.

2.18 Utilising financial metrics as a project control

The use of financial ratios as a base for the analysis of project performance is very often used as a motivation for a project based on the value of the investment as a return on capital spent. A commonly used principle is the Return on Investment or ROI. The concept of which relates to the evaluation or comparison of the efficiency of an investment to alternative investments. The ROI is usually utilised as a motivation for a project capital expenditure at Business Case level. The business case is constructed as a baseline motivation for project expenditure. Corman (2012) defines the core structure of a business case as:

- Forecasted financial benefits on the value the project will create for the organisation
- Projected project costs over the project lifecycle
- Detail analysis of benefits and cost drivers, typically a “cost-benefit analysis”
- Displaying these variables in conjunction with each other utilising financial Metrics

The financial metrics are then utilised as a visual presentation of the value component of the project to confirm the investment value of the project capital expenditure relative to alternative investment opportunities.

To calculate the return on an investment, the benefit (or return) of an investment is divided by the financial capital cost of the investment. The result of the calculation is presented as a percentage (Investopedia, 2016).

The breakdown of the formula equates to:

$$\frac{\text{Total Benefits} - \text{Total costs}}{\text{Total Costs}}$$

In relationship to the project methodology, the financial benefit of the project is done in a business case (Feasibility stage of the project) as a primary driver of the decision making process. The calculation is then repeated at the end of the project (Project closure) to review the actual value brought by the project.

Although the concept of a ROI calculation is valuable as a comparison tool, the main constraints in the utilisation of this calculation is that the time value of money (impact of inflation) is not considered in the calculation and that the magnitude of the investment is not measured in terms of scale in relationship to the risk exposure of the organisation. The investment could, therefore, be either R10 or R1mil. There would be no differentiation on the return. (Corman, 2012). With this constraint in mind, the measure is a good benchmark on the objectives of the project with a quantifiable estimated return with a post implementation review to analyse the actual return, based on actual costs and benefits realised.

In conjunction with the ROI calculation, a payback calculation allows for a qualified time to recover the costs of the project in relation to the accumulated project benefits. The objective of this calculation is to determine a future period where the total net benefits of the project (Benefit – Costs) move from a negative value to a positive.

The payback calculation metric is a clear representation of business on the value of a project in terms of the anticipated impact on relative cash flow requirements. The calculation in relation to cash flow should indicate the potential of financing a project if the project, for example, would extend over multiple years. (Corman, 2012) As with the ROI calculation, the payback metric should be considered as a metric both on project initiation and closure as an indication of the relative success of project delivery.

2.19 Conclusion to the literature study and a definition of project success.

The traditional measures of project success: are “Delivery of the project within Scope, On time and within budget”. The question related to the research is if these measures are still adequate in evaluating project success or should other factors be included such as Business stakeholder ownership and acceptance. A project could fulfil the above criteria and still be defined as a failure due to business requirements not being included in the design.

As project management matured and within the scope of this review, in the Information technology ERP environment, the criteria for managing a project has evolved. As the complexity and detail further matured, a project multiple dimensions and layers of influence and stakeholder engagement increased, the traditional measures of project success is limited in terms of a relative measure of success.

The investigation of alternate perceptions of the elements of projects that could be seen as drivers of project success contribute equally in weight than the traditional view of a project seen as successful if it adhered to the criteria of being completed within the allocated timelines, was completed within the relative terms of the budget and delivered the results as per the scope of the project. These then include, change management approaches, training leadership, project management, project risk management and organisational strategy as components driving project success and individually could potentially drive the perception of a project being successful or not.

To derive a definition of project success an argument may be that the pillars of project success can be defined by the traditional scope, budget, and timeline. However, the project cannot be seen in isolation of the underlying building blocks that anchor these pillars. Each one of these pillars supports the structure, either directly or indirectly. An end user might, for example, perceive a project as negative or failed, as the strategic objectives of the project might not affect the end user directly. In this example utilise the concept of corporate centralisation as an objective of an ERP implementation. For a corporate strategic point of view, the project might be viewed as successful as it delivered this objective. Subjectively the end user might have a perception that now he or she is redundant and the project failed them.

Is this not the base of the perception of many parties that projects tend to fail while key stakeholders might perceive the same sort of project as a success? Stakeholder management

with related communication structures could perhaps be a more accurate baseline to define the realms of success.

A good benchmark for project methodology management might be to return the focus of projects to an integrated approach with business as stated by (Bloch M, Blumberg S, Laartz J, 2012) as a clear approach to managing strategy and stakeholders, mastering technology and the content of technology, building strong project teams with strong capabilities and focusing on improving project management capabilities with a structured focused approach to managing a project. By keeping these areas structured a baseline can be established to build project improvement structures on.

From the analysis of this literature review, the view could be that the definition of project success must be defined in terms of the perception of the relevant key stakeholders that derive intrinsic value out of the project. This view should be supported by managing project deliverables such as data, training, technical quality, change and communication and structure to the point that stakeholders can be engaged and involved to a point that project objectives are aligned to corporate structures, goals, objectives and strategy.

Chapter Three

Research Methodology

3.1 Introduction

This chapter provides an overview of the research methodology. It will outline the methodology used for research and provide a description to the approach adopted in the design of the research. The identification of the selected study population with estimated size is described and the theoretical sampling technique is discussed. The research approach is depicted utilising a quantitative data collection approach. For this study, interest in the design and organisation of the questionnaires are articulated to illustrate a logical step through the process for the end user of the questionnaire. This chapter also observed the diverse statistical tests that were used to analyse the data gathered, the reliability and legitimacy of the results including the limitations in data collection with regards to population, sample size, and geographical constraints.

3.2 Aim and Objectives

3.2.1 Aim of the research

The aim of this study was to identify the factors affecting the perception of project success during an ERP Implementation and to identify weaknesses in the approach by investigating the data collected from several ERP projects in South Africa, limited to KwaZulu-Natal and Gauteng. These projects were sampled as delivered on time and within budget, utilising modern implementation methodologies with a defined scope of delivery.

3.2.2 Objectives of the Research approach

The objectives listed below have been designed with the purpose of identifying and understanding those factors that are responsible for the affecting the improvements required in ERP implementation methodologies to support:

- Levels of perception of project success within the different levels of the

organisation structure within a business.

- Identifying positive outcomes of the project
- Identifying subjective areas of improvement within the view of the participant in relation to organisational structure and qualifications
- Attaining the involvement level of the participant and the understanding of implementation methodologies utilised in ERP projects.
- Identification of business resources utilised in the project
- Business Analysts/ Consultant Skill
- Quality and approach in Change management, Communication, and training
- Affirmation of the initial view of project success and failure.

3.3 Research Methods

3.3.1 Research Design

Research design deals with the structure involved in researching and bringing to realisation the aim and the objectives of the study. It is described by (Sekaran & Bougie, 2013) as the process of gathering and analysing the required data in line with the framework set out for the study.

The suggestion is that research design must be broken into two areas. The first areas are to identify and develop the procedure for the while the second area relates to the focus on the validity, objectivity, and accuracy of the research.

During research design, issues regarding the purpose of the study, the location of the study, the population and sampling design, data collection methods, measurement of the data and analysis of the data are established. The objective of good research design should be to minimise bias and maximise the reliability of the data (Kothari,2008).

3.3.2 Research Strategy

The research design adopted for this study was to utilise quantitative data collection as a non-intrusive method to collect the experiences of respondents during project implementation.

The survey was a cross sectional survey and administrated through an electronic medium. “SurveyMonkey” was the selected electronic medium as it allowed for a structured interface for the statistical analysis of the data. Various statistical calculations and analyses of the data were undertaken using a statistical software package. The information was then assembled into a graphical representation and then inferred and discussed under Chapter four this dissertation.

According to (Sekaran & Bougie, 2013), sampling begins with precisely defining the target population which is itself defined in terms of data elements, geographical boundaries, and timelines.

Sampling is the process of selecting the right individuals, objects, events or representation for the population to be studied. The sample identification and selection process is an integral process in research design and can be either probability or non-probability sampling (Sekaran and Bougie, 2013). Non -probability sampling was selected for the study. When elements in the population have known, zero chance of being chosen as subjects in the sample, we resort to a probability sampling design as an alternative. Probability sampling can be either unrestricted (simple random sampling) or restricted (complex probability sampling) in nature. Non-probability sampling is used when the elements do not have known or predetermined chance of being selected as subjects.

The type of data required largely determines the collection method to be employed as primary data is obtained for the first time by the researcher and secondary data has already been collected by someone else and has passed through the statistical processes (Kothari, 2008). A researcher, when using survey research, may use quantitative methods, qualitative methods or combination thereof. The researcher, in this case, opted to use a quantitative method.

Quantitative research involves the measurement of quantity or amount after collecting and converting the data (Kothari, 2008). For example, in quantitative research, the data is gathered through structured questions in a questionnaire which can be measured and analysed. The research instrument for this study made use of a web based online survey software hosted by “SurveyMonkey” in order to gather primary research data.

Quantitative methodology was the preferred methodology, because of the advantages

presented. One of the advantages was the ability to administer the questionnaires throughout KwaZulu-Natal. For this research study, the questionnaire (Appendix 1) was created on web based online survey software. All the information that was obtained was measured and analysed to determine whether any relationships exist between the variables identified.

3.3.3 Materials, Apparatus and Instruments

For the data collection in the study, an online questionnaire was designed an instrument to facilitate the collection of data (Appendix 1). The questionnaire was developed based on the literature review conducted, as well the researchers work experience in the area of ERP project management. Online administration of questionnaires offers many benefits (Dörnyei & Taguchi, 2010). These may include

- Easier access to a wider geographical population. Due to the nature of modern communication, utilising the power of the internet allows for simplified methods of communication with the target audience of the survey.
- Timeous as the survey software is able to collect and process data instantaneously that previously had to be administered by hand. This allows for quicker data collection and significant increases in the quality of the research.
- Easier integration into statistical analysis software such as SPSS as the data is formatted and structured in a logical database.
- Cost savings as no postage or manual administrative procedures are required.
- More visually appealing questionnaire are presented to end users as graphics, clean structures and colour can be included.
- Facilitation of ease of use actions for responders, for example, drop down menus and radio buttons.
- More convincing assurance for the anonymity of respondents as the online structure provides for a non-personal completion of the survey
- The progress of the response rates can be monitored, managed and controlled by the researcher with ongoing feedback on progress and quality of responses

A key consideration in designing this research questionnaire was to ensure that all the research objectives were met in terms of the problem statement. The questionnaire was

designed in terms of the existing project methodology principles as a baseline structure with added detail from the literature review to support the content quality.

In designing the questionnaire, attention was placed on the length of the questionnaire. The questionnaire was kept as short as possible. The questions were short, simple and unambiguous. There open-ended questions were limited to one question only as an opportunity to allow the responder to share additional information. A variety of measurement scales were used which included dichotomous questions and Likert questions. The majority of the questions were based on Likert-scaling as this proved to be most appropriate for the study. As noted by Sekaran and Bougie (2013), Likert scaling is one of the most frequently used numerical scales to measure attributes and behaviours in an organizational research.

By allowing the respondents to choose the appropriate options presented in the Likert scale format, this enabled less room for ambiguity and confusing data and in turn was an attempt to logically walk through the experience of the responder in the previous ERP project. Likert scale was used for several close-ended questions.

Using the Likert scale is an efficient technique for attaining reliable assessment responses and enables the participants to present responses that are a little more unreserved than a simple close-ended question

3.4 Sample Strategy

3.4.1 Location

The focus of the research is the South African market with a view to the demographics of using world class leading edge software in a developing economy and the challenges surrounding Industrial Organizations running projects utilizing ERP and ERPII systems implemented in the previous five years. The research is further limited to KwaZulu-Natal and Gauteng as a geographical focus area.

3.4.2 Sample sizing

Sampling is obtained from three focus groups within the ERP market in the selected research environment. The key focus area of the study is that the sample was generated from selected projects, completed on time and within budget, with a defined project scope as deliverable. A prerequisite was defined as projects that were managed using modern Implementation

Methodologies such as SAP's ASAP methodology. Within the population the following project contributors were targeted:

- Consultants
- Business Technical Resources
- Business system users.
 - Senior resources involved (Managers)
 - System users
 - Stakeholders.

The sample size was obtained from the generalised scientific guideline for sample size decisions developed by Krejcie and Morgan (1970), as cited in Sekaran and Bougie, (2013). The population studied is estimated at 800 contributors. The population was focused on users of ERP systems implemented with a focused approach on KZN and Gauteng within the last 4 years where senior management deemed the projects as successful (On time, on budget and completed scope of work). Within the individually identified business an estimated population of 800 system users and stakeholders were identified, Sekaran (2013) suggests a sample size of 201.

3.4.3 Data Collection

Data collection was approached on a content analysis base, to identify specific project activities that could be statistically correlated to project failure or even success. The data was tabulated from collection to identify the frequency of an occurrence.

Data was collected via standardised electronic survey with a list of directed questions, identifying sample demographics, experiences, and quality of the project implementation methodology. The survey was distributed to businesses corresponding to the core requirement of operating in the South African manufacturing and supply chain environment. The questionnaire was also distributed using key consulting and business partners with an interest in the results, via an email from the researcher containing an electronic link to the survey monkey electronic tool. The email contained a high-level brief of the background to the study and assurance was provided that the responses would be confidential and anonymous. A reminder email was sent twice a week to the target population to encourage participation in the survey. The survey was opened for a duration of one week and an email

was launched to advise the target group on the closing of the study. A total of 235 responses were accounted for.

3.5 Analysis of data

SurveyMonkey was used to integrate the online survey data for analysis. Sekaran and Bougie (2013) stated that the data obtained from the questionnaire need to be statistically coded in order to determine variation and this process involves assigning numbers to responses so that the data can be grouped into categories. SurveyMonkey automatically captured data as and when every respondent clicked on the survey link.

The software program enabled a numerical code to be assigned to each variable which could then be exported to Microsoft excel from SurveyMonkey and loaded into as Statistical Package for Social Sciences (SPSS) or to cross reference with another variable to determine any correlation relationships (SurveyMonkey, 2016).

This study used descriptive or inferential statistics to perform the analysis of data. Keller (2012) defined descriptive statistics as methods of organising, summarising, and presenting data in a convenient and informative way using graphical and numerical techniques. Inferential statistics is defined as methods used to draw conclusions or inferences about characteristics of a population based on sample data (Keller, 2012)

Graphical techniques are used as the descriptive analysis method. The data was presented in the form of graphs, pie charts and tables. Numerical techniques are used to present data in the form of percentages, proportions, frequencies and measures of central tendency and dispersion.

The researcher analysed whether any relationships exist between two variables or whether they are independent of each other. Per Keller (2012), this can be statistically confirmed by the chi-square (X^2) test, which indicates whether or not the observed pattern is due to chance and thereby establish whether any relationships exist. Any p -value less than 0.05, is an indication that a significant relationship exists between two variables and that it did not happen by chance.

3.6 Reliability and Validity

Validity in quantitative research refers to whether the means of measurement are accurate and whether they are actually measuring what they are intended to measure (Joppe, 2000).

As cited by Sekaran and Bougie (2013) Pre-test according to Schindler and Cooper (2006) is described as a final step towards improving survey results. As further noted by Sekaran and Bougie (2013), pre-testing has a number of advantages which includes identification of possible ethical problems, helps to determine if the research questions or hypotheses are appropriate and provides information on the feasibility and the appropriateness of the sampling method. The researcher used an independent Industrial Psychologist students to evaluate the appropriateness of questionnaires and a pre-test was conducted on two respondents who were not an element of this study. There were no major areas of concerns that were noted or experienced and the data received were reconciled with what it was planned to collect.

Reliability in quantitative research refers to whether the result is replicable, the extent to which results are consistent over time and an accurate representation of the total population under study. If the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable. The method that is commonly used as a measure of reliability is Cronbach's alpha.

The Cronbach's alpha measure was above 0.70 which is an acceptable measure of reliability.

3.7 Bias

Bias is a systematic error that can prejudice your evaluation findings in some way.

Bias can occur at any phase of research, including study design or data collection, as well as in the process of data analysis (Taylor-Powell, 2009).

Data analysis error is a form of bias, created when raw data is transformed into erroneous research findings. This can be done through inappropriate uses of statistical techniques, leading to the incorrect interpretation of the survey results (Penwarden, 2013). In the research study, the data analysis error bias was minimized using SurveyMonkey and SPSS system which analysed the data.

Sampling bias can occur any time your sample is not a random sample. If it is not random, some individuals are more likely than others to be chosen. In the research study the sampling bias was eliminated when the respondents were chosen randomly based on For the purposes of this study, the probability sampling method was used as this sampling method utilises some form of random selection a simple random sampling technique.

3.8 Ethical considerations

Various ethical actions were performed during this research study. Firstly, ethical clearance (Appendix 2) for the study was granted by the University of KwaZulu-Natal Humanities and Social Sciences Research Ethics Committee on the 31st of January 2017 (Protocol Reference Number: HSS/2070/016M) from the University of KwaZulu-Natal's (UKZN) research office. Permission documentation (Appendix C) was obtained from the key focus business, with consent to conduct research on their business resources.

3.9 Chapter Summary

This chapter highlighted the research methodology, research design, sample method and data analysis techniques used for this study. The chapter highlighted the research paradigm, design and the selected methodology for the execution of the study. The chosen methodology was motivated in terms of its relevance to the research problem. A discussion was presented on the research instrument employed as utilising an online self-administered questionnaire in a quantitative approach. The web based online survey software hosted by SurveyMonkey was used to administer the questionnaire and used to gather primary research data. Data was then extracted into SPSS for further analyses Validity, reliability and biases of the study were outlined, followed by the ethical clearance. The next chapter to follow (Chapter four), will provide a detail presentation and discussion of the research results obtained from the questionnaires.

Chapter Four

Presentation of Results and Discussion

4.1 Introduction

This chapter presents the analysis, results, interpretation and discussion of the study as extracted from SurveyMonkey as a collection tool and analysed using SurveyMonkey. This study is a case study that seeks to explore the perception of project failure and based on a post project environment where the shortcomings in standard project implementation methodologies might exist. The study utilised qualitative design as a method for data collection. Quantitative data was cross sectional and was analysed in SPSS. In keep with the methodology, all data was analysed at 95% confidence interval (Norušis, 2012).

The findings each of the main research questions are broken down and analysed based on the result as viewed in totality and then a subset of only positive answers to the notion of project success.. The literature review is referenced to explain and support the manifesting phenomena where evident.

The results can be generalised to the generic approach when reviewing ERP projects in the larger scale of project deployments in South Africa as a theoretical guide on where to focus future projects on avoiding perceptions of failure.

4.2 Reliability

Following the consolidation of results, data collection methods must be reliable and valid. Sekeran (Sekaran & Bougie, 2013, p. 228) explains the reliability of the dataset as the reoccurrence of the same results after numerous repetition of the study methodology (without Bias). Factor analysis generates reliability statistics (internal consistency) that will provide information on the reliability of the instrument used to collect data on bank selection criteria. Internal consistency is used to determine the consistency across items within a test and this will be used for assessing the reliability of this study. Bourque and Clark (1994) stated that reliability is assessed for two purposes. Firstly to ensure the reliability of the scale is sufficient, and secondly to determine the effects of each item on reliability. Sub-scale variance can also influence reliability. Therefore the order of the questions presented can influence the research. To improve instrument reliability the survey will start off with more general questions.

Sekaran & Bougie (2013) defines interim consistency reliability as a test for consistency in the answers provided by the respondent. The correlation of the responses to a similar concept, is most commonly measured by Cronbach’s coefficient alpha.

For each of the Likert scale sub set of statements, a reliability test is conducted.

Table 4.1 Test scale = mean (unstandardized items)

| Item | Test scale |
|---------------------------------------|-------------------|
| Average inter item covariance: | 0.129 |
| Number of items in the scale: | 23 |
| Scale reliability coefficient: | 0.719 |

Table 4.1 shows the internal consistency of the Likert scale questions is 0.719, indicating the reliability of the results.

4.3 Quantitate Results

The questionnaire was designed with logical groupings of questions, to test the literature review practically in the target research group. The subdivision of the questionnaire aimed to identify specific tendencies and correlation in terms of project success. The areas analysed included, project methodology, supporting the notion that although the management of project had indeed matured over time, to identify areas in project implementation methodology where a correlation could be found with project success or failure. The next component referred to consultant skill level. With the level of consulting skills, in some cases bias towards the software implemented, could it be that there were shortcomings in the approach used by consultants through the project life cycle that could attribute to project failure. The third component of the questionnaire dealt with the notion of change management. The grouping consisted of all the “softer” components of project implementation. This would include general change management, communication, training and business involvement. The key concept to test if there is a correlation between the softer business aspects and perceptions of project success.

The questionnaire was further segregated and consolidated in the four sections. Each question is then presented in a tabulated form with the full sample response. Below the full sample response, a second presentation of the question is filtered according to respondents

that viewed their previous ERP implementation as successful. The discussion then centres on trends between the views.

4.3.2 Objective 1: Understanding the role players in ERP projects, their background and their own skillsets. `

This section aims at understanding the respondents and aligning the characteristics of these stakeholders and project partners to the perceptions of project success or failure.

Question 2: “Describe your role in the last large ERP project in your organisation”.

This question aims to determine the involvement of the responded in the project. Zuber (2014) suggests that end user involvement is critical to project success. There would be an expectation that there is a correlation between different levels of project involvement and project success.

Table 2.2 Questionnaire -Responder’s role in the SAP project – Question 2:

All survey responses consolidated

| 2. Describe your role in the last large ERP project in your organisation | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Business SAP User | 66.8% | 149 |
| Business Project team member | 15.2% | 34 |
| SAP Super User | 5.4% | 12 |
| SAP Consultant (Internal or External) | 12.6% | 28 |

Question results displayed only for positive responses to project success in Question 5

| 2. Describe your role in the last large ERP project in your organisation | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Business SAP User | 49.6% | 56 |
| Business Project team member | 22.1% | 25 |
| SAP Super User | 4.4% | 5 |
| SAP Consultant (Internal or External) | 23.9% | 27 |

The results indicate an expected spread of responses with the bulk of the population being business users, then project team members, followed by technical resources, confirming the sample potentially targeted the correct population base as a demographical breakdown of project participants and stakeholders.

When the results are viewed only the population that reviewed the implementation as successful, the ratio drops significantly. Project team members, including consultants, view the project as a success, where less than 50% of end users view their recent project as a success. This must be viewed in terms of the expectation that most probably consultants view project success significantly different than end users. A project that might be well within budget and technically completed to standard, so within the perspective of the consultant the project might be a success, the end user does not necessarily experience the system in the same way as the consultant or business analyst as a daily user of the system, potentially with design constraints affecting productivity and effective daily operations. The perception of the success of a project potentially is different between different organisational role-players. The importance of end user support for an ERP project is highlighted as a primary risk by (Seo, 2013, p. 10) for ERP project success. Seo mitigates this project risk by focusing on end user training.

Question 3. *“At what level, do you operate within the business?”*

The question aims to define the organisational structure and position of the responded in terms of company hierarchy. Is the respondent for example in an executive role, that potentially influences project strategy and decision or an end user that experiences a project implementation.

Table 4.3 Questionnaire - Responders level in the organisation. Question 3:

All survey responses consolidated:

| 3. At what level do you operate within the business? | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Executive or Director | 17.0% | 38 |
| Senior Management | 14.3% | 32 |
| Management | 24.7% | 55 |
| Operational/Business SAP user | 43.9% | 98 |

Question results displayed only for positive responses to project success in Question 5:

| 3. At what level do you operate within the business? | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Executive or Director | 27.4% | 31 |
| Senior Management | 26.5% | 30 |
| Management | 17.7% | 20 |
| Operational/Business SAP user | 28.3% | 32 |

View of project success based on the level of the respondent

| Answer Options | Response Percent | Responses |
|-------------------------------|------------------|-----------|
| Executive or Director | 88.9% | 40 |
| Senior Management | 87.5% | 70 |
| Management | 70.0% | 70 |
| Operational/Business SAP user | 41.0% | 25 |

The question positions the respondents in terms of organisational structure and as per the organisational breakdown of the business. The bulk of system users is expected to be operational. What is significant in terms of the survey responders, are those who indicate a positive ERP experience where the trend moves towards a greater view of project success in terms of the level of operation (job status) within the organisation. The results would then suggest that the more senior the Stakeholder is, the larger the probability of observing value

in ERP systems. This would correlate to the notion that senior business users would have a more intrinsically rounded view of the business strategy and direction and potentially would position the value of an ERP system, beyond the operational effort it might induce and confirms the research by Pecherskaya and Lyudmila (2016) where senior management is defined as a high risk priority as a critical success factor for an ERP project.

Question 4. “*What is the highest level of education you have completed?*”

The question aims to identify any correlation between the level of education and the perception of project success. The objective of the question is to identify a correlation between the perceptions of project success and the responded educated to a level of inclusive business skill level in terms of tertiary education.

Table 4.4 Questionnaire- Respondents level of education. Question 4:

All survey responses consolidated

| 4. What is the highest level of education you have completed? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Matric | 13.9% | 31 |
| Certificate | 10.3% | 23 |
| Technical qualification | 21.5% | 48 |
| Degree | 26.5% | 59 |
| Post Graduate Degree | 27.8% | 62 |

Question results displayed only for positive responses to project success:

| 4. What is the highest level of education you have completed? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Matric | 7.1% | 8 |
| Certificate | 20.4% | 23 |
| Technical qualification | 4.4% | 5 |
| Degree | 25.7% | 29 |
| Post Graduate Degree | 42.5% | 48 |

The general list of respondents indicated a general spread of qualifications within the population sample. The positive response list indicated a correlation to the results from

question 3 where more senior stakeholders rate the ERP implementations as successful. The responses indicated that more than 42.5% of positive respondents have a post graduate qualification. And more than 68% of positive respondents are degreed. The expectation is probable that a higher educational base would be closer to understanding corporate objectives and strategy and probably would view an ERP implementation as more positive. The research confirms the argument by Zuber (2014), quoting Viskovic (2008) to include all stakeholders in project success measures, including end users. The research does indicate a trend in the negative perception of project success is potentially then on an operational level, rather than senior stakeholders.

Question 5. *“Rate your last ERP Project in terms of your view on Success.”*

This question is the first direct attempt to test the respondent’s view of project success. The aim of the initial question is to have a first review of how the responded viewed the project. The question was placed at the beginning of the questionnaire to allow for a first perception of the responder.

Table 4.6 Questionnaire -Responded view on project success. Question 5:

All survey responses consolidated

| 5. Rate your last ERP Project in terms of your view on Success: | | |
|--|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Major Success | 50.7% | 113 |
| Success | 0.0% | 0 |
| Completed to standard | 0.0% | 0 |
| Partially Successful | 49.3% | 110 |

The response to the question indicated a split of roughly half of respondents indicating project success in their last ERP implementation. This is in contradiction to Atkinson (2013) that suggest a 70% view of failure across the corporate spectrum. This question is used as a base for all response differentiation by viewing the responses in terms of this breakdown.

31. *Please rate the following statement: "The ERP project has positively improved our business in terms of reporting, structure and potential savings such as for example procurement."*

This is the second question in terms of project success. The positioning of the question at the end of the questionnaire is designed to test the question of project success after the respondent reviewed the project activities and rated these as components of project success.

Table 4.7 Questionnaire Impact of the ERP project on Business. Question 31:

All survey responses consolidated:

| 31. Please rate the following statement: "The ERP project has positively improved our business in terms of reporting, structure and potential savings such as for example procurement." | | |
|--|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Strongly agree | 28.3% | 63 |
| Partially agree | 15.7% | 35 |
| Agree | 9.9% | 22 |
| Strongly disagree | 37.7% | 84 |
| Count | 223 | |

Question results displayed only for positive responses to project success:

| 31. Please rate the following statement: "The ERP project has positively improved our business in terms of reporting, structure and potential savings such as for example procurement." | | |
|--|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Strongly agree | 54.9% | 62 |
| Partially agree | 24.8% | 28 |
| Agree | 17.3% | 20 |
| Strongly disagree | 2.7% | 3 |
| Count | 113 | |

The question confirms question 5's response by evaluating the respondent's view after testing the perceptions and experiences of the components of the project. The concept being that as the respondent reviews certain aspects of the project, project experiences are reviewed rather than an overall perception of the project being projected.

A further point to note is that with the control test on whether the respondents viewed projects as a success or not, 10% of respondents who completed the survey, changed their view on the success of the project, from an initial negative perception. This would suggest that within the locus of control an ERP system user, might perceive a new ERP system as a negative impact on their daily activities, however as the end user experiences a broader

analysis of the scope of an ERP project, the perceptions of success become more positive. This would further support the notion that with a more inclusive approach to involving end users in the project objectives and different components of project delivery would create a larger perception of project success. This is supported by the view of Battleson (2013) in his suggestion that business problems, rather than technological challenges are a bigger source of failure in projects. As users understand the larger context of an ERP solution their perceptions towards the project changes.

4.2.3 Objective 2: Understanding the impact of Project Management

The category of questions focuses on the project methodology and the functioning of the project management structures. The questions to be answered from this section, include the clarification of the implementation methodology used and the identification of any correlation between project failure and the main components of the management of a project. In this section, there potentially may be bias in terms of the perception that a good project manager might overshadow a slightly flawed project methodology and secondly a lack of understanding of project methodology by respondents as it is a specialised field with tasks that might not be indiscriminately visible to end users and even executive members on a project. The category was constructed on questions 6,7,8,17,22 and 23 of the survey.

Question 6. *“What was done well on the project (more than one answer can be provided)?”*

The question is aimed at identifying positive project actions that might show correlation to project success. The key component would be to identify activities in the project management process to support mitigate the risk of a perception of project failure.

Table 4.8 Questionnaire - Positive project activities. Question 6:

All survey responses consolidated:

| 6. What was done well on the project (more than one answer can be provided)? | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Project budget met | 52.9% | 118 |
| Timelines of the project met | 73.5% | 164 |
| Scope of the project workload met | 52.0% | 116 |
| Business Requirements addressed with the project | 40.8% | 91 |
| Adequate training was presented with the project | 14.3% | 32 |
| Adequate change and communication during the project | 13.0% | 29 |

Question results displayed only for positive responses to project success:

| 6. What was done well on the project (more than one answer can be provided)? | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Project budget met | 68.1% | 77 |
| Timelines of the project met | 72.6% | 82 |
| Scope of the project workload met | 57.5% | 65 |
| Business Requirements addressed with the project | 61.9% | 70 |
| Adequate training was presented with the project | 27.4% | 31 |
| Adequate change and communication during the project | 25.7% | 29 |

Significant to note was that the bulk of the respondents viewed the traditional project measures of time, scope, and budget, in the same way, even respondents who did perceive a negative project experience. The result does provide a base for further study that the traditional measures of project management when viewed in isolation, do not provide the correct stakeholder perception of project success. Despite the results confirming the argument of the Project book of Knowledge (PMBOK,2013, p7), the implication is that these factors, although important to managing a project, should not be managed in isolation when used as a base for reporting project success.

What is significant, is that in projects viewed as successful, a much higher measure of business requirements understanding and consideration is present. It does emphasise the

literature review and King IV (2016, p. 52) that the views of all stakeholders need to be included in project methodologies with much higher focus.

A larger focus on change management is also present in successful projects.

Question 7. *“Was a clear software implementation methodology followed, typically with clear Blueprinting, a Build phase, a Testing cycle and sign off?”*

This is a direct attempt to test the usage of a project methodology in the project as per the experience of the survey responded. There are two possible negative answers to this answer, firstly a perception of no structured methodology due to the end user’s direct involvement and secondly the notion that actually there was no management structure to the project. For the scope of this research, the assumption will be made that there was a focused project methodology but this was not the experience of the survey responded.

Table 4.9 Questionnaire - Use of a project methodology. Question 7:

All survey responses consolidated:

| 7. Was a clear software implementation methodology followed, typically with clear Blueprinting, a Build phase, a Testing cycle and sign off? | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Yes | 94.6% | 211 |
| No | 5.4% | 12 |

Question results displayed only for positive responses to project success:

| 7. Was a clear software implementation methodology followed, typically with clear Blueprinting, a Build phase, a Testing cycle and sign off? | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Yes | 100.0% | 113 |

The question does indicate that in modern ERP projects a clear implementation methodology is used to manage projects. This response confirms the research assumptions using projects managed in a structures approach in the research population.

Question 8. *“Were risks and issues highlighted and mitigated in a formal way? These would include business constraints such as a yearend impact.”*

As with question 7 this question would attempt to test the utilisation of methodology and project management best practises by the project manager.

Table 4.10 Questionnaire -Project Risk management. Question 8:

All survey responses consolidated:

| 8. Were risks and issues highlighted and mitigated in a formal way? These would include business constraints such as year end impact. | | |
|--|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Yes | 64.6% | 144 |
| No | 0.4% | 1 |
| Not sure | 35.0% | 78 |

Question results displayed only for positive responses to project success:

| 8. Were risks and issues highlighted and mitigated in a formal way? These would include business constraints such as year end impact. | | |
|--|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Yes | 90.3% | 102 |
| No | 0.0% | 0 |
| Not sure | 9.7% | 11 |

A correlation between the responses to question 7 indicates that the general perception of successful projects indicates an acknowledgement of risk management as a project management function associated with project success. The results confirm the argument of De Bakker (2011) in the practical application of project risk management as a component of the toolsets associated with project implementations and ultimately contributes to project success.

Question 17. *“Please explain the level of User Acceptance Testing (UAT) done on the project.”* Testing is a key driver to project success. A positive test experience would ensure that the solution is fit for use and operationally deployable. The survey attempts to find a correlation between project success and the quality of testing performed.

Table 4.11 Questionnaire - User Acceptance testing. Question 17:

All survey responses consolidated:

| 17. Please explain the level of User Acceptance testing(UAT) done on the project | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| I have no idea what User Acceptance testing is. | 9.0% | 20 |
| Some User Acceptance testing was done, with limited business users | 26.9% | 60 |
| User Acceptance testing was formally done and signed off informally with business involvement | 41.7% | 93 |
| Formal multiple sessions of User Acceptance testing was done and signed off | 22.4% | 50 |

Question results displayed only for positive responses to project success:

| 17. Please explain the level of User Acceptance testing(UAT) done on the project | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| I have no idea what User Acceptance testing is. | 0.0% | 0 |
| Some User Acceptance testing was done, with limited business users | 10.6% | 12 |
| User Acceptance testing was formally done and signed off informally with business involvement | 51.3% | 58 |
| Formal multiple sessions of User Acceptance testing was done and signed off | 38.1% | 43 |

A strong indication that that well managed testing is a driver of project success in the result of 89% of users in successful projects indicates that formal User Acceptance Testing was done. This figure drops to 64% in general results, indicating the importance of good user acceptance testing. A further unusual response indicates that in project success, User Acceptance testing is repeated and this repetition increases the perception of success to 38%. This concept should be noted by project management in planning testing cycles. The research supports the ASAP (SAP AG , 2011) methodology highlighting multiple cycles of testing the proposed ERP solution to reduce the risk of implementation technical constraints and the project alignment to business requirements.

Question 22. *“The project used a Business Integration specialist/Solution Architect, bridging the multiple areas the project covered between the process areas/ERP modules.”*

A technical solution architect does provide structure to a complex ERP project. The question would test the correlation between project success and the utilisation of a solution driven management structure from a technical perspective.

Table 4.12 Questionnaire - Use of a Solution Architect. Question 22:

All survey responses consolidated:

| 22. The project used a Business Integration specialist/Solution Architect, bridging the multiple areas the project covered between the process areas/ ERP modules | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Yes | 54.7% | 122 |
| No | 22.9% | 51 |
| Unsure | 22.4% | 50 |

Question results displayed only for positive responses to project success:

| 22. The project used a Business Integration specialist/Solution Architect, bridging the multiple areas the project covered between the process areas/ERP Modules | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Yes | 79.6% | 90 |
| No | 11.5% | 13 |
| Unsure | 8.8% | 10 |

The research indicates a correlation between project success and the use of a project Solution Architect and supports the argument that strong integration between the project team members and business stakeholders allow for a larger possibility of perceived project success. The research further supports the notion that cross business structure integration would be a component of project success and should be a component of the implementation management structure. The research further supports the ASAP (SAP AG , 2011) approach of strong business and project alignment as integrated components of an ERP implementation project.

Question 23. *“Please rate the skill level of the Consultant Project Manager.”*

The question is a direct attempt to test the skillset of the project manager in terms of solution success. The question was focused at the technical skillset of a consulting project manager to support the notion that utilising external technical skills in project management may have a correlation to project success.

Table 4.33 Questionnaire - Project management skillset. Question 23:

All survey responses consolidated:

| 23. Please rate the skill level of the Consultant Project Manager (Select one or more answers) | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Project manager was out of his league on the project | 4.5% | 10 |
| The Project manager had good Project Management skills | 71.3% | 159 |
| The Project manager had good Business Process understanding | 72.6% | 162 |
| The project manager had a good understanding of the software implemented (consultant level) | 68.6% | 153 |
| The project manager had a good understanding of the Business Strategy and approach | 66.4% | 148 |

Question results displayed only for positive responses to project success:

| 23. Please rate the skill level of the Consultant Project Manager (Select one or more answers) | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Project manager was out of his league on the project | 1.8% | 2 |
| The Project manager had good Project Management skills | 77.9% | 88 |
| The Project manager had good Business Process understanding | 79.6% | 90 |
| The project manager had a good understanding of the software implemented (consultant level) | 74.3% | 84 |
| The project manager had a good understanding of the Business Strategy and approach | 85.0% | 96 |

Even the research indicates that in general project management skills do not have an influence on project success. The assumption must be emphasised that the skills of the project managers in the sample were on a professional level and the results of the survey should be viewed in that light. The results confirm that good execution of the project methodology does allow for on time, within budget and at agreed scope of project deliverables are supported by good project management. However these traditional measured do not support project success as per the

Question 28. “In hindsight, the following could have been done differently/better (Select one or more answers)”

The question is a direct attempt to initiate positive feedback from the responded and to conceptualise the view of the responder to improve project methodology in future projects and research.

Table 4.44 Questionnaire – Project activities that could have been done differently. Question 28:

All survey responses consolidated:

| 28. In hindsight, the following could have been done differently/better (Select one or more answers) | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Project goals/objectives could have been stated better | 44.4% | 99 |
| Project should have been aligned closer to business objectives (group) | 38.1% | 85 |
| Project should have been aligned closer to business objectives (Business Unit) | 36.8% | 82 |
| Better analysis of business requirements | 34.1% | 76 |
| Where was senior management? | 32.7% | 73 |
| Too little Business Involvement | 33.6% | 75 |
| Too much Business Involvement | 0.4% | 1 |
| Consultant skills | 38.1% | 85 |
| Project Management Skills | 6.3% | 14 |
| Training | 22.4% | 50 |
| Communication | 17.5% | 39 |
| Change management | 17.9% | 40 |

Question results displayed only for positive responses to project success:

| 28. In hindsight, the following could have been done differently/better (Select one or more answers) | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Project goals/objectives could have been stated better | 36.3% | 41 |
| Project should have been aligned closer to business objectives (group) | 30.1% | 34 |
| Project should have been aligned closer to business objectives (Business Unit) | 35.4% | 40 |
| Better analysis of business requirements | 22.1% | 25 |
| Where was senior management? | 12.4% | 14 |
| Too little Business Involvement | 28.3% | 32 |
| Too much Business Involvement | 0.9% | 1 |
| Consultant skills | 26.5% | 30 |
| Project Management Skills | 11.5% | 13 |
| Training | 17.7% | 20 |
| Communication | 25.7% | 29 |
| Change management | 15.0% | 17 |

The key areas to review would be the observations in terms of highlighting project objectives to be closer to business and stakeholder management. These concepts indicate that in terms of the system end user, technical results are not mutually exclusive in determining project success. These findings align to the view of (Worsley, 2016) aligning project proficiency, project utility, project financial and corporate societal value to stakeholder management. Of concern is the constant trend that consultant skills are a constraint, be it successful projects or projects seen as less successful. The notion of consultant skillsets is discussed within later questions.

29. *“Please rate the software(ERP System) selected in terms of business needs.”*

This question aims to test the perception of the responded if the software implemented corresponds to business needs and will add value. There should be a correlation between the perception of success and the perceived fit of the software to the business requirements.

Table 4.15 Questionnaire - Business needs answered. Question 29:

All survey responses consolidated:

| 29. Please rate the software(ERP/SAP System) selected in terms of business needs | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| The software was a perfect fit to the business | 52.0% | 116 |
| The software was well suited for the business but badly implemented | 29.1% | 65 |
| The software might work in some areas of this industry but misses the point | 15.7% | 35 |
| The software was oversold and a total mismatch to the business. | 3.1% | 7 |

Question results displayed only for positive responses to project success:

| 29. Please rate the software(ERP/SAP System) selected in terms of business needs | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| The software was a perfect fit to the business | 72.6% | 82 |
| The software was well suited for the business but badly implemented | 20.4% | 23 |
| The software might work in some areas of this industry but misses the point | 7.1% | 8 |

This response would support the notion of a control question to validate survey results. As could be expected the more successful a project is deemed, the closer the fit would be on software fit to business requirements. Beneficial to note for the project manager, is that in some cases the end user might regard a project as successful, even if the implemented software allows for isolated success factors within their locus of influence and operations. These results align to the correlation results presented by Bukama (Bukama & Abu Wadi, 2016) where a high correlation to ERP success was obtained by a good fit of the software to the business.

Question 30. *“Do you feel that your business was ready for your ERP Go-live in terms of the following (Select one or more).”*

This question relates to the technical appreciation of the solution rather than the people integration or change components of the solution. The correlation between the question responses and project success should provide additional admonition for project managers to incorporate into project methodology as a preparation phase enrichment.

Table 4.5 Questionnaire - Business Readiness. Question 30:

All survey responses consolidated:

| 30. Do you feel that your business was ready for your ERP Go-live in terms of the following (Select one or more)? | | |
|--|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Level of awareness | 55.6% | 124 |
| Leadership support | 30.0% | 67 |
| Infrastructure | 35.0% | 78 |
| Skills and knowledge (Training) | 32.3% | 72 |
| Business processes | 28.7% | 64 |
| Data | 25.6% | 57 |
| None of the above | 4.0% | 9 |
| Organizational Structures (Who needs to do what) | 35.0% | 78 |

Question results displayed only for positive responses to project success:

| 30. Do you feel that your business was ready for your ERP Go-live in terms of the following (Select one or more)? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Level of awareness | 63.7% | 72 |
| Leadership support | 40.7% | 46 |
| Infrastructure | 50.4% | 57 |
| Skills and knowledge (Training) | 24.8% | 28 |
| Business processes | 31.9% | 36 |
| Data | 19.5% | 22 |
| None of the above | 0.9% | 1 |
| Organizational Structures (Who needs to do what) | 30.1% | 34 |

This response aligns with both the positive and overall project perceptions. Significant to note is the high level of leadership support and levels of project awareness, despite the responses in question 28.

In summary, the research indicated that should project management increase the awareness of project activities performed, the end user's experience of how a project was managed would not significantly change. It should be noted that this would not indicate that project management is irrelevant. As per the assumptions in the selection of the population of the study, professional levels of management is a key criteria for the selection of the projects reviewed.

A further component of the research indicating a trend is the testing of the system functionality in conjunction with end users, where there is a correlation between the involvement of end users in testing in at least an awareness of the testing process or as a negative component an indication that the testing was insufficient to address the complexities of the business activities supporting project end result user testing. This finding does support the notion that the approach to testing perhaps needs further research that extends the scope of pure technical testing to an inclusive model that includes the daily activities that an end user or a business user might experience in their daily application of the system. The finding does suggest that as in the case with training a more inclusive approach to testing should be investigated as an improvement on the traditional scripted approach to testing. With the modern delivery of ERP systems by suppliers the systems have limited constraints in technical functionality. This then provides the opportunity to change

the approach of end user testing to a more inclusive approach that would engage more business constraints and activities rather than a traditional, outdated technical test.

Additional findings included the notion that in successful projects the respondents indicated that a solution integration resource was used in successful in the project. In contrast where projects were deemed not quite successful there was a significantly lower usage of technical and business integration resources. This finding supports the concept that there is potentially a divide between technical and business skill levels within the population surveyed. The findings indicate that by utilising a cross skilled resource(s) that can function on both technical and business levels, projects seemed to be more successful. This finding does provide further research opportunities in terms of the skillset of business resources utilised in projects and the related technical skillsets knowledge of business activities.

In general, this section supports an action for project managers to promote clearer understandings why projects are executed and what the potential benefits are across the layers of stakeholders and project participants. This requirement is supported by high numbers of respondents that required a better understanding of the project goals and objectives.

Further to the above, evidence supporting the argument of better end user understanding of the projects, procedures and software used, was the evidence that the fit of the software was incorrect. This perception can be attributed to a better understanding of the business case of the project, the communication of the project and the change cycle of introducing new systems to a business. The striking component being that many respondents challenged the quality of the work to implement the software. This supports earlier findings on ensuring that all project stakeholders are clear on the objectives of a project implementation and the strategic intent of the project, rather than relying on end user education to relate to the corporate strategy

4.3.4 Objective 3: Understanding Change Communications, Training and Stakeholders

This section attempts to find a correlation between the project engagement with stakeholders and project success. While technically the project might be considered successful there potentially could be subareas of the project methodology where inadequate engagement with end users might affect the perception of the success if the project.

Question 9. “To what extent were Business Process Specialist used in the Project?”

This question attempts to investigate the correlation between utilizing senior business skills in the project life cycle as an approach to constructing and manage business process build and communication management of these changes.

Table 4.6 Questionnaire - Use of Business Process Specialists. Question 9:

All survey responses consolidated:

| 9. To what extent were Business Process Specialist used in the Project? | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Not sure if there were any involvement on our project | 22.0% | 49 |
| Very limited use, more a title than a function. Their role was unclear to me | 26.5% | 59 |
| Process Owners/Senior Business staff added value to the project. | 40.8% | 91 |
| Process Owners/Senior Business staff made this project work | 10.8% | 24 |
| Other (please specify) | | |

Question results displayed only for positive responses to project success:

| 9. To what extent were Business Process Specialist used in the Project? | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Not sure if there were any involvement on our project | 17.7% | 20 |
| Very limited use, more a title than a function. Their role was unclear to me | 14.2% | 16 |
| Process Owners/Senior Business staff added value to the project. | 54.9% | 62 |
| Process Owners/Senior Business staff made this project work | 13.3% | 15 |
| Other (please specify) | | |

The response to this question would support the notion that an ERP Implementation project does require senior business user involvement to deliver project success. This correlates to the literature review and the King IV notion of stakeholder management. The value of the process owner is indicative in the positioning of the solution in terms of business leadership and future business strategy and roadmap alignment. The Process owner and consultant should be mutually exclusive in terms of function but aligned in terms of a stream or modular focus. The challenge to the project manager is the integration these functions at the correct stages of the project, with clear role clarity. The argument is further supported by Bukama

(Bukama & Abu Wadi, 2016) stating the high levels of importance of Management involvement in project implementation.

Question 10. “*To what extent were Super Users / Experienced Business Users, used in the Project?*”

As with question 9, the approach is to test the concept of the utilisation of strong end users in constructing the project. Super Users, also known as Power Users are included in the project build to be deployed back into the business to assist as a business user, with specialised product skills. The business Super user then becomes a direct change agent to the business.

Table 4.7: Questionnaire - Use of Business Users on the projects. Question 10:

All survey responses consolidated:

| 10. To what extent were Super Users / Experienced Business Users, used in the Project? | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| No Super User structure exists in the organisation / in our business unit | 0.4% | 1 |
| Very limited use, more a title than a function | 36.3% | 81 |
| Super users were included in the build, testing and training | 52.9% | 118 |
| Super Users were involved from Blueprinting to Go-Live | 10.3% | 23 |

Question results displayed only for positive responses to project success:

| 10. To what extent were Super Users / Experienced Business Users, used in the Project? | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| No Super User structure exists in the organisation / in our business unit | 0.9% | 1 |
| Very limited use, more a title than a function | 11.5% | 13 |
| Super users were included in the build, testing and training | 68.1% | 77 |
| Super Users were involved from Blueprinting to Go-Live | 19.5% | 22 |

The responses indicate that a key driver to project success is the involvement of Super Users. Super Users add a dimension to the project that builds the operational detail required to cater

for a comprehensive solution. The research supports the notion that high levels of Super User involvement that extend through the project life cycle do support the perception of successful projects. The involvement of these types of users can extend to multiple aspects of the project, including detail process design, data management, testing, and training. The key consideration for project management is the business knowledge that well selected Super Users can add to an ERP project. The results also relate to Bukama (Bukama & Abu Wadi, 2016) where he highlights the right resources and equipment allocated to the project team, including human resources.

Question 11. “*What would describe Change Management in the most accurate way?*”

This question is aimed at determining the usage of change management techniques in the project execution. A positive correlation is expected to the utilising of specialist skills and project success.

Table 4.8 Questionnaire - Change Management. Question 11:

All survey responses consolidated:

| 11. What would describe Change Management in the most accurate way? | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Change Management was excluded in the project | 0.4% | 1 |
| Change was just communication to end users (Posters, roadshows and email) | 61.9% | 138 |
| Communication on all levels of the business, Change facilitation and being there for me | 28.3% | 63 |
| Communication, Change, Organisational Structuring and being there for me | 9.4% | 21 |

Question results displayed only for positive responses to project success:

| 11. What would describe Change Management in the most accurate way? | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Change Management was excluded in the project | 0.0% | 0 |
| Change was just communication to end users (Posters, roadshows and email) | 38.1% | 43 |
| Communication on all levels of the business, Change facilitation and being there for me | 43.4% | 49 |
| Communication, Change, Organizational Structuring and being there for me | 18.6% | 21 |

As per the literature review, the change management model has evolved over time to become a key people integration function for an ERP project. The constraint faced by project managers is that the practical aspects of the role have not in been incorporated into the full project management approach. The research confirms that in some cases the project change is limited to communication, rather than an integrated cross functional business approach to aligning people, process, and technology. This concept does require more research to substantiate the role of change management in light of overlapping or distorting the role of organisational Human Resource Management. The approach should potentially be a coherently directed approach to people integration. The results align with the questions posed by Hornstein (2008) where the questions are raised whether change management is focused on the larger stakeholder group rather than the message that executive management want to project and if the change management activities were translated into operational measures. The research suggests further focus on the change activities in ERP implementation projects to answer these questions.

Question 16: *“In your view, who were the primary Stakeholders/Participants in the project?”*

This question attempts to understand the involvement of Stakeholders in the project. As per the literature review, the definition of Stakeholders had changed over time and the question attempts to align this message to project success. The secondary question to answer would be to identify a correlation where consultants rather than business stakeholders drove project deliverables, thereby understanding a correlation between project success and the drivers of the project.

Table 4.9 Questionnaire - Primary Stakeholders. Question 16:

All survey responses consolidated:

| 16. In your view, who were the primary Stakeholders/Participants in the project? | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| IT (SAP consultants)and Business representatives made a brilliant team | 28.7% | 64 |
| IT (SAP consultants) drove the project, Business just tagged along | 58.3% | 130 |
| Business representatives drove the project, IT just did what was told | 8.1% | 18 |
| Consultants had very little input from business or business IT | 4.9% | 11 |

Question results displayed only for positive responses to project success:

| 16. In your view, who were the primary Stakeholders/Participants in the project? | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| IT (SAP consultants)and Business representatives made a brilliant team | 50.4% | 57 |
| IT (SAP consultants) drove the project, Business just tagged along | 33.6% | 38 |
| Business representatives drove the project, IT just did what was told | 15.9% | 18 |

The results of the questionnaire reveal a core problem in the ERP implementation approach. The lack of business leadership presented by the evidence is confirmed by the high levels of projects being driven by consultants and the view of consultants rather than business resources defining the project design deliverables. The result of this level of interaction in the project environment is the project solution emulating a technology driven set of deliverables, rather than strong process driven deliverables aligned to business objective. This potentially can create the impression of IT driven projects that deviate from the business. The secondary risk is the deviation from the corporate strategy and value chain differentiators by delivering a solution to potential product best practices rather than business requirements. The research highlights the argument of Miller and Mike (2015, p8) where a clear map of the project stakeholders need to be managed as part of the project, followed up by a prioritisation of stakeholders and their project roles and the development of these stakeholders in the role. This clear role identification and responsibility allocation is highlighted as improvement activities that need to be included in the project managers activities in ERP project implementation.

Question 18. *“Please explain the extent of training presented during the project.”*

Training as a key process to upskill business users in the utilisation of the project and as a communication tool for potentially new Business Processes. The question attempts to find a correlation between training and project success.

Table 4.10: Questionnaire - Extent of Project Training. Question 18:

All survey responses consolidated:

| 18. Please explain the extent of training presented during the project | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Limited training was presented by consultants. | 30.9% | 69 |
| Limited training was presented by business Users | 20.2% | 45 |
| Extensive training was presented by consultants and business users. | 45.3% | 101 |
| Extensive training was presented by external parties, consultants and business users | 0.9% | 2 |
| E- Learning was distributed and users trained electronically | 2.7% | 6 |

Question results displayed only for positive responses to project success:

| 18. Please explain the extent of training presented during the project | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Limited training was presented by consultants. | 28.3% | 32 |
| Limited training was presented by business Users | 16.8% | 19 |
| Extensive training was presented by consultants and business users. | 53.1% | 60 |
| Extensive training was presented by external parties, consultants and business users | 1.8% | 2 |
| E- Learning was distributed and users trained electronically | 0.0% | 0 |

The responses confirm that project training is being conducted during ERP projects, corresponding to the suggestions by Chayakonvikom, et al. (2016) that effective learning in terms of education and training approaches lead to enhanced user acceptance of project (Guiney, 2015) experiences. What is noticeable is that modern electronic training is not actively used in projects. What adds to this abnormality is an inconsistency, where modern training was used, the respondents indicated that it contributed to the perception of failure. This finding is significant as it substantiates the notion that within the South African ERP environment electronic learning is not a substitute for direct interaction between a facilitator and an end user in learning. This finding does allow for further research on this topic. Possible reasoning could include the typical age or educational profile of end users, taking into account that a number of the respondents are highly educated on a higher educational

level. Further alternatives can be the adoption of technology in the South African culture or even the concept of quality of electronic learning in an age of rapid technology advances. The reasoning is supported by Guiney (2015) in their research in a developed country that systems and infrastructure to support electronic learning are widely available, however business do not have the capability to implement these systems successfully in terms of end user adoption. In an attempt to overcome these design inadequacies in e-learning courses, new skills and personnel are required in project and learning teams to focus on the design, build and delivery of these tools.

Question 19. *“Please explain the quality of training presented during the project.”*

As an extension of question 18, this question attempts to identify the quality of the training presented and if there is a correlation with project success.

Table 4.11 Questionnaire - Quality of Training Presented. Question 19:

All survey responses consolidated:

| 19. Please explain the quality of training presented during the project | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Weak, half-baked quality written just before the course. | 18.8% | 42 |
| Average quality of training, using generic training material | 64.1% | 143 |
| Excellent training presented of a high quality, | 17.0% | 38 |

Question results displayed only for positive responses to project success:

| 19. Please explain the quality of training presented during the project | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Weak, half-baked quality written just before the course. | 0.9% | 1 |
| Average quality of training, using generic training material | 66.4% | 75 |
| Excellent training presented of a high quality. | 32.7% | 37 |

The responses confirm that project training quality, in general, is of a good nature. Where projects are rated at successful the research indicates a tendency towards a higher quality of presentation. The learning to the project manager would be to invest in facilitation and

presentation skills in order to improve the perception of the trainee to promote a more positive project experience. The findings align to Chayakonvikom, et al. (2016, P486) highlighting the importance of presentation in training in terms of user adoption of the information.

Question 20. *“Please explain the content of training presented during the project.”*

The quality of the training material utilised in training might cause additional frustration and confusion by end users. By identifying a correlation between success and training content might indicate a reason for end user frustration.

Table 4.12: Questionnaire - Training Content. Question 20:

All survey responses consolidated:

| 20. Please explain the content of training presented during the project | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Basic training material representing the software being implemented | 57.0% | 127 |
| Good quality training material written by software experts that understand business processes | 27.4% | 61 |
| Business process training followed by Software training was presented within the documentation | 9.9% | 22 |
| Outsourced training, presented by software experts was presented as training documentation | 5.4% | 12 |
| No training documentation was presented. | 0.4% | 1 |

Question results displayed only for positive responses to project success:

| 20. Please explain the content of training presented during the project | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Basic training material representing the software being implemented | 38.1% | 43 |
| Good quality training material written by software experts that understand business processes | 38.1% | 43 |
| Business process training followed by Software training was presented within the documentation | 14.2% | 16 |
| Outsourced training, presented by software experts was presented as training documentation | 9.7% | 11 |

The responses provide an expected outcome that would confirm that higher quality project training material does tend to create better project results. Noticeable though is that projects with basic training material also rated as successful, to a point of 38% of a successful project.

This would support the concept that learning is a variable that requires further investment in projects. Chayakonvikom, et al. (2016) raises the concern with training content as the training material being static and does not reflect the real business scenario, rather than just a list of transactions used to execute the ERP system. Further observations indicated that the training content should be wider than the focus area of the training subgroup. The implication for the training approach on an ERP project is to evaluate alternative approaches to learning and even learning materials should be considered during ERP projects. Project learning initiatives in the South African contexts as a developing country does provide an opportunity for further research.

Based on the observations by Chayakonvikom et al. (2016), learning can be summarised with two components. The first observation indicates that there is no correlation between the responsibility for training presentation and project success. The research indicates that presentation of training could be done with the utilisation of any project resource, rather than a training or consulting specialist. The result being that any skilled project member can deliver training with no preference that is associated with project success. The opportunity for project managers are substantial cost savings by utilising internal skills such as super users and process owners rather than external resources such as technical consultants to present training.

A second component of training indicates the evidence that successful projects utilise generic material. The practical implication being that an investment in training material that presents a good procedural overview in conjunction with technical training presented in a professional format would support a larger probability for project success. The research supports the argument in the literature review that learning has evolved to a point beyond that of technical skills that present a generic systems approach. The evolution of training has moved towards a progressive format that presents process and contextual training information that empowers the end users to place the training in the context of the relevant high level processes associated with the ERP implementation. The approach further lends to the opportunity to embed change management activities and strategic alignment into the training curriculum.

Question 21. *“The project in my mind involved the correct levels (Senior management vs operational staff) from business participants.”*

This question tests the end users perception of senior management involvement in the project. Senior management might provide a sense of direction and assurance that the project is focused on business objectives.

Table 4.13: Questionnaire - Senior Management Involvement. Question 21:

All survey responses consolidated:

| 21. The project in my mind involved the correct levels (Senior management vs operational staff) from business participants | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Yes | 60.5% | 135 |
| No | 39.5% | 88 |

Question results displayed only for positive responses to project success:

| 21. The project in my mind involved the correct levels (Senior management vs operational staff) from business participants | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Yes | 81.4% | 92 |
| No | 18.6% | 21 |

This research finding supports the notion that projects require visible and active participation by senior management that potentially align the business to corporate objectives and guide business users through the change process. As per the literature review, the findings support the King III and King IV alignment process to senior management responsibility and structures. The learning for the project manager is to ensure that key stakeholders are involved in decision making and leadership.

Question 24. *“Please rate communication during the project.”*

A lack of communication in a project could create confusion and frustration on an end user level. This question aims to investigate a correlation between communication between the project team and business and project success.

Table 4.14: Questionnaire - Project Communication. Question 24:

All survey responses consolidated:

| 24. Please rate communication during the project. | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Communication was frequent, focused and understandable | 27.8% | 62 |
| Communication was infrequent but delivered the message | 59.2% | 132 |
| Communication missed the point | 13.0% | 29 |

Question results displayed only for positive responses to project success:

| 24. Please rate communication during the project. | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Communication was frequent, focused and understandable | 48.7% | 55 |
| Communication was infrequent but delivered the message | 50.4% | 57 |
| Communication missed the point | 0.9% | 1 |

This research component confirms that communication to stakeholders need not be that frequent, but must include a clear message. What is significant is that there is small variation towards inadequate communication and the notions of project failure, implying that communication has a relatively small impact on stakeholder perceptions on project success. This view is supported by Worseley (2016) highlighting the importance of structured communication with enough detail for the stakeholder to stay informed, time to process information and to respond to situations in a constructive engaging approach and opportunity to be engaged in a meaningful way.

Question 25. “Where did you find the most project information?”

The question aims to test the effectiveness of general communication platforms as a general toolset to improve project communication platforms. A low correlation between the question and project success is expected.

Table 4.15: Questionnaire - Project Information Source. Question 25:

All survey responses consolidated:

| 25. Where did you find the most project information? | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Your Manager | 12.6% | 28 |
| E-mail updates | 51.6% | 115 |
| Posters | 9.4% | 21 |
| Intranet | 5.8% | 13 |
| Project Briefings | 20.6% | 46 |

Question results displayed only for positive responses to project success:

| 25. Where did you find the most project information? | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Your Manager | 13.3% | 15 |
| E-mail updates | 49.6% | 56 |
| Posters | 8.8% | 10 |
| Intranet | 0.0% | 0 |
| Project Briefings | 28.3% | 32 |

This research finding confirms that email is the preferred medium of communication in conjunction with project briefings in the modern organisational environment. Traditional approaches of posters seem to have a small impact in terms of information delivery. The lack of Intranet/ Internet usage indicates a correlation to the usage of electronic learning as a communication medium. This finding aligns to the research presented by (Oberholster, 2014) supporting the use of hybrid communication media for managing change in projects. However there is a slight contradiction that Oberholster’s research found a preference in face to face communication (56.4%) and then email (27.8). Welch (2011, p. 250) aligns closer to the findings from this survey with 47% preferring electronic communication (email). The research confirms that project managers should focus on a hybrid model for communication that consists of email as a primary communication tool, supported by face to face sessions.

Question 26. “Was the reason why the ERP system was being implemented clearly explained and do you feel the reason was clear why business went on this journey?”

The question is aimed at testing the alignment of the responder to corporate strategy and understanding the reason for a complex project such as an ERP Implementation. The suggestion is that should the requester provide a positive response, there is an indication of well-structured communication and corporate alignment.

Table 4.16 Questionnaire - ERP Rationale. Question 26:

All survey responses consolidated:

| 26. Was the reason why the ERP system was being implemented clearly explained and do you feel the reason was clear why business went on this journey? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Yes | 79.7% | 177 |
| No | 11.3% | 25 |
| The reason why SAP was implemented is still a mystery to me | 9.0% | 20 |

Question 26, Question results displayed only for positive responses to project success:

| 26. Was the reason why the ERP system was being implemented clearly explained and do you feel the reason was clear why business went on this journey? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Yes | 90.3% | 102 |
| No | 8.8% | 10 |

This response confirms that clear alignment to the motivation for implementing an ERP system is important. The research confirms that the understanding of the reason for an ERP system in isolation does not provide enough motivation to measure the success of an ERP system. The research again aligns to Worseley (2016) highlighting the importance of structured communication with enough detail for the stakeholder to stay informed. This would include detail information on why the project was being introduced

Question 27. *“Were there any business restructures during your ERP Go-live?”*

Project restructuring as a component of project implementation potentially could create a negative project view. The question aims to identify any resulting negative associations between project implementation and organisation restructuring.

Table 4.17 Questionnaire - Project Subject to restructuring. Question 27:

All survey responses consolidated:

| 27. Were there any business restructures during your ERP Go-live? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Yes | 91.4% | 203 |
| No | 8.6% | 19 |

Question results displayed only for positive responses to project success:

| 27. Were there any business restructures during your ERP Go-live? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Yes | 82.3% | 93 |
| No | 16.8% | 19 |

The responses confirm that restructuring is indicative with ERP projects. Headcount reduction is potentially a component of the business case for such a project and a managed re-alignment of business roles creates a platform for restructuring. Worsley (2016) confirms this event in ERP projects in that major projects potentially leave a significant, sometimes visible reminder of project investment. This introduces much broader, more unpredictable, and very powerful stakeholder engagement layer and highlights the requirement for continuous senior manager involvement.

In summary, beyond the complexities related to training, the research confirmed that training is an activity that process owners and super users need to be involved in. The correlation between senior management involvement and project success confirms the literature approach by PMBOK (2013, p. 6) and King IV (2016, p. 48) supporting the notion of an inclusive stakeholder environment, governed and structured by a senior management team. The implication for project management is that by emphasising and expanding the role of senior management into direct project involvement during the project life cycle, there is a greater probability for perceived project success. The secondary implication is to ensure that project teams work in close harmony with senior management in a structured environment.

The process is governed and managed in a formalised project steering structure that allows for a managed journey through the project implementation life cycle

Communication correlation to project success results, support the research that successful projects tend to have frequent communication, emphasising that information updates have a positive effect on the perception of stakeholders on progress. The medium of engagement also indicated that direct project updates and focused email is the most effective way of bring this message. It allows for the platform to present and re-emphasise the reason for project implementation, organisational objectives and direct targeted messages to project stakeholders. To be noted, is the research confirmation, indicating the use Internet and Intranet types of communication is not a key focus area of information for stakeholders. With the assumption that email and direct engagement is a successful channel to stakeholders, a more formalised structure could be developed to identify the content and type of message to be conveyed to stakeholders at different stages of the project life cycle. A further variable is the differentiation to position communication to different layers in the organisational structure slightly different and at different levels of detail and content.

In a related topic to change management / people integration and communication is the high occurrence of organisational restructuring that is presented in the bulk of ERP projects. The project risk associated with restructuring is the perception that the ERP project might cause the individual to potentially risk unemployment, directly as a result of the project. With the high occurrence of restructuring in ERP projects there then is an opportunity to enrich the project implementation methodology with a structured approach to manage organisational role and position changes.

4.3.5 Objective 4: Understanding Business Analyst / Consulting Skills

The section aims to identify the notion if there is a correlation between the skillsets presented by technical project resources and business understanding. With the ever increasing complexities of the evolution of ERP systems and the integrated nature of these, a potential reason for project failure is the inability of consultants to understand business detail processes and the impact thereof on project success. The questions in this section attempt to identify correlation between project failure and Business Analyst skills.

Question 12. *“How would you rate the general Consultant skill level?”*

This question is directly focused on the perception of the responded of the level of consultant skill deployed in the project. There is some bias in terms of the population that consultants are included in the survey and by nature of self-measurement, there would be an expectation of overstating skill.

Table 4.18 Questionnaire - Consultant Skill level. Question 12

All survey responses consolidated:

| 12. How would you rate the general Consultant skill level? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| A balanced combination of business and technical ERP skills | 21.1% | 47 |
| Good technical skills ERP consulting but lacking enough practical business skills | 72.6% | 162 |
| Good business skills but lacking enough practical technical ERP consulting skills | 5.8% | 13 |
| Too weak to have been consultant on such a complex project | 0.4% | 1 |

Question results displayed only for positive responses to project success:

| 12. How would you rate the general Consultant skill level? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| A balanced combination of business and technical ERP skills | 40.7% | 46 |
| Good technical skills ERP consulting but lacking enough practical business skills | 48.7% | 55 |
| Good business skills but lacking enough practical technical ERP consulting skills | 10.6% | 12 |

The survey response addressing consulting skills raise questions in terms of the quality of project resources operating as consultants in South Africa. There are two distinct poles, where the first is a technical resource that is highly qualified in his area of speciality who is constrained by an inability to relate to business scenarios. The other extreme, the lack of technical skills and a focus on business rather than technical delivering abilities. Both scenarios indicate a delivery and quality risk to the project manager that needs to be addressed in project resourcing. Barbar (2014) supports this finding with the engagement

levels of consultants in business that are associated to project success based on the experience levels of the consultant.

Question 13. “How would you best rate the investigation (Blueprinting) workshops as run by the project consultants?”

Blueprinting is the foundation workshop where primary processes are documented and mapped for a future project state. By efficiently managing the blueprinting process there is a potential correlation to project success. The question aims to find a correlation between consulting skills and Blueprinting workshop facilitation and information gathering.

Table 4.19 Questionnaire - Blueprinting Workshops. Question 13:

All survey responses consolidated:

| 13. How would you best rate the investigation (Blueprinting) workshops as run by the project consultants? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Excellent, the consultants understood the business requirements as explained | 27.8% | 62 |
| Good, but the consultants did not quite understand the detail business needs | 24.7% | 55 |
| Average, the consultants seem to have understood the basics, but missed a lot | 38.6% | 86 |
| Below Average, the consultants missed the point | 9.0% | 20 |

Question results displayed only for positive responses to project success:

| 13. How would you best rate the investigation (Blueprinting) workshops as run by the project consultants? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Excellent, the consultants understood the business requirements as explained | 43.4% | 49 |
| Good, but the consultants did not quite understand the detail business needs | 38.1% | 43 |
| Average, the consultants seem to have understood the basics, but missed a lot | 18.6% | 21 |

The responses highlight the business importance of efficient Blueprinting skillsets supporting the perception of success in the project lifecycle. The area of management that the project manager needs to be aware of is that more than 50% of projects require better

management of Blueprinting workshops, irrespective of the notion of project success. The implied question is the consideration of the magnitude of inefficient management of Blueprinting workshops, the understanding of business principles and the documentation of these discussions and the impact of design quality of ERP solutions of these Blueprinting sessions. Following the impact of the quality of the Blueprinting process, there is an implied budget impact due to rework in terms of effectiveness and efficiency and the end user perception of a system not performing as designed. Again the correlation to the findings of Barbar (2014) where the understanding of business processes by consultants is a variable linked to the experience of the consultant, further supported by the notion of senior management involvement in guiding the process.

Question 14. *“How did the solution build by the Consultants match business requirements on a business process level?”*

The question attempts to identify the perception of project quality in terms of the project aligning to business processes as experienced by the survey respondent.

Table 4.20 Questionnaire - Quality of System build. Question 14:

All survey responses consolidated:

| 14. How did the solution build by the Consultants match business requirements on a business process level? | | |
|---|-------------------------|------------------|
| Answer Options | Response Percent | Responses |
| Excellent, A perfect match resolving many business issues | 15.2% | 34 |
| Good, but some of the detail was missing | 50.2% | 112 |
| Average, the system does the basics and not much more | 26.5% | 59 |
| Below Average, the system ended up being of substandard quality | 8.1% | 18 |

Question results displayed only for positive responses to project success:

| 14. How did the solution build by the Consultants match business requirements on a business process level? | | |
|--|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Excellent, A perfect match resolving many business issues | 30.1% | 34 |
| Good, but some of the detail was missing | 61.1% | 69 |
| Average, the system does the basics and not much more | 8.8% | 10 |

Building on the responses of blueprinting constraints, even in successful projects, less than a third of project respondents indicate the technical solution to be as per the business requirements presented. This research confirms the shortcoming that consulting skills do not cater for business process and requirement facilitation skills. This shortcoming leads to increased rework and post system implementation support. This research again aligns with the findings of Barbar (2014) with the engagement levels of consultants in business. Related to this finding is the alignment of senior management to project engagement to align the consultant or business analyst to business objectives, allowing for closer alignment between business and project team members.

Question 15: *“How did the solution build by consultants match business reporting (including key performances Indicators (KPI) and Financial) requirements?”*

This question attempts to review the quality of business reporting as an indication of technical project success. Reporting in its nature implies that the business extracts information from the completed system build and represents it as a representation of a business activity. The alignment of reporting to project success is the final check point to align project quality to that of technical business requirements.

Table 4.21 Questionnaire - ERP reporting supporting of Business Requirements. Question 15:

All survey responses consolidated:

| 15. How did the solution build by consultants match business reporting (including key performances Indicators (KPI) and Financial) requirements? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Excellent, A perfect match resolving many business reporting issues | 17.5% | 39 |
| Good, but some of the key reporting requirements were missed | 49.3% | 110 |
| Average, the system provided the bare basics for reporting, but missed important data such as Key performance measures and operational reporting | 4.5% | 10 |
| Below average, mainly focused on finance | 27.8% | 62 |
| Weak, the system did not provide adequate reporting | 0.9% | 2 |

Question results displayed only for positive responses to project success:

| 15. How did the solution build by consultants match business reporting (including key performances Indicators (KPI) and Financial) requirements? | | |
|---|------------------|-----------|
| Answer Options | Response Percent | Responses |
| Excellent, A perfect match resolving many business reporting issues | 34.5% | 39 |
| Good, but some of the key reporting requirements were missed | 61.9% | 70 |
| Average, the system provided the bare basics for reporting, but missed important data such as Key performance measures and operational reporting | 2.7% | 3 |
| Below average, mainly focused on finance | 0.9% | 1 |

Further to the findings on Blueprinting skillsets and technical build quality, the final component to evaluate technical build quality is the ability to understand business requirements in terms of reporting. The responses confirm the shortcomings that consultants do not understand business requirements well enough and potentially force technology solutions on perceived business problems and these two poles are not always aligned. The results further confirms the required engagement between key stakeholders and business and

the involvement of senior business resources in conjunction with skill levels of consultants further correlating to the findings of Barbar (2014)

In summary of this section, the research supported the literature review in terms of the Business Analyst / Consulting resource skillsets. In projects where stakeholders do not view the project as successful, the notion is further supported that consultant skills are a constraint. Technical consultants tend to be focused on technical solutions that support the software being implemented, in many cases referring to prescribed processes for generic processes in many cases without consideration of business nuances and strategic objectives. This would create a perception that either the consultant does not understand business complexities or would try and enforce preconceived experiences onto the business process that potentially does not cater for business nuances. This concern is confirmed by the research suggesting project success when utilising a solution architect as part of the solution, potentially to manage the alignment of business processes and technical solution design.

The consulting constraint is further highlighted by the research confirmation that failed projects show a correlation towards weak facilitation skills, even as early as project Blueprinting phases. This further substantiates the concern that technically skilled resources might be weak in managing information gathering sessions with a consequence that the design process does not cater for these business unique process complexities that support the strategic differentiators in the value chain. The lack of facilitation skills would then further confirm the notion that consultants do not always understand business processes good enough to cater for these complexities.

The research confirmation that consultants potentially do not understand the complexities of business reporting requirements, be it statutory, operational or strategic. This observation further supports the notion that due to a lack of understanding and appreciation of business activities and processes, consultants tend to fall back on predesigned reporting structures during project construction rather than a deep understanding of the real customer requirement. The result being that the system potentially is perceived as not presenting the anticipated business value with a bias then to suggest project failure. The inherent incompatibility by so called “Standard reporting” as delivered by the software then becomes a symbol of consultant skills shortages. There are two distinct poles, where the first is a technical resource that is highly qualified in his area of speciality but creates an inability to

relate to business scenarios. The other extreme the lack of technical skills and a focus on business rather than technical delivering abilities.

4.4 Chapter Summary

This study was focused on quantitative where data was collected electronically utilising the Survey Monkey toolset. The summary data was then analysed using SPSS software and the key themes and summary responses under each question was presented and discussed. To confirm the reliability of the data, the data was analysed at a 95% confidence interval and Cronbach alpha of 95%. The result was a high reliability of data that could be utilised in constructing meaningful conclusions.

The final results were presented in a graphical and tabular format and all significant highlights of the data presented and correlation analysis performed on the total results. The data was evaluated and discussed under each of the research questions, with a clear review on why the result was obtained in conjunction with the literature review. The localised research findings highlight that the constraints faced in South African ERP implementations (in particular large SAP implementations) are not unique and in many forms correlate to challenges faced in the wider scope of ERP implementations as per the literature review.

The next chapter links the objectives and the findings of the study. Conclusions together with recommendations to address the research problem will be proposed and suggestion for future studies will be presented.

Chapter Five

Conclusions and Recommendations

5.1 Introduction

The study has undertaken to gain an understanding of perceptions of large scale failure when implementing ERP projects. In a modern society, the majority of large corporate entities make critical decisions based on information extracted from ERP systems, implying that a perception of failure might be placing undue risk on the organisation decision makers as the quality of information extracted from these systems. It then becomes imperative to ensure that there is a good understanding of where these perceptions come from, or at least if they indeed have any substance. Should there then be shortcomings in the traditional approach to implementing these systems to ensure data of a high quality, these need to be understood to be managed. This section of the dissertation will present the conclusion of the research and establish if the research questions have been resolved.

The implications and benefits in understanding the shortcomings in modern implementation projects may provide a new baseline to improve the quality of these deployments. To substantiate the findings, the chapter will finally be concluded with recommendations for further studies.

5.2 Conclusion and Recommendations

The data and the discussion of the previous chapter provided substantial insight into the components of an ERP implementation in relation to project success. This provides key information components from which conclusions may be drawn. Conclusions based on empirical findings that have been drawn in relation to each of the objectives. The discussion below outlines the findings from the mixed method approach and the literature basis. The outcome of each question was evaluated to establish the relevance in answering the research question.

The survey did not test the quality of the implantation methodology, details of risk and issue management or even the relevance of the detail in which a methodology was followed was not surveyed. This includes components such as audit processes or even data management. For the population sampled the assumption was that technical deliverables were met, in time and in budget. The process includes the delivery of the technical solution with associated

master and transactional data. The assumption used was that these components were managed, but despite the management of the larger project deliverables, the individual stakeholder and project team member's perceptions of success is tested on components building up to the Implementation Methodology.

5.2.1 Objective 1: Understanding the role players in ERP projects, their background and their own skillsets

The results of this section provide the base for the analysis of the data. What is significant in this section is that with the data presented there seems to be a slight tendency for end users to be negative towards project success. Even though the senior business stakeholders are less likely to view a project as a not successful, there is a definitive requirement to focus on end users as stakeholders as per the King IV guidelines. This would suggest a requirement for a more inclusive approach to end user management. The shortcoming could be addressed by:

- a larger, stakeholder inclusive Blueprinting process, with a wider scope of user involvement to establish a more inclusive wider input of process system design that includes the appropriate consulting skills and end user management,
- a more focused communication to empower end users with more information, alignment to project and organisational objectives using email as a primary communication platform, supported by face to face engagement sessions,
- a training approach updated with more information to empower the end user with information that potentially includes process and operational training to enable technology and process enrichments brought by an ERP project. This alignment procedure should become a component of the people integration stream (change management) of the implementation team with a goal to use training to align and connect end user to the corporate and project objectives.

5.2.2 Objective 2: Understanding Project Management

The questions supporting this section was designed to test the quality of project management, traditional views of project management and the usage of governance structures. The general view from the responses, indicate the role and activities of the project manager is not well understood in the general project environment. This was supported by alternative questions where the test indicated whether the respondents were aware of the methodology structures and the risk management components of the project.

The recommendation would be that the project methodologies allows for an increased awareness of project activities performed as an educational component on project progress.

A further component of the research that indicated a trend is the testing of the system functionality in conjunction with end users. The recommendation would be to approach testing constructively extending the scope of pure technical testing to an inclusive model that includes the daily activities that an end user or a business user might experience in their daily application of the system. By extending testing beyond the technical aspects of the ERP system, end users are exposed to the future business state earlier assisting with change management and a more detailed solution business fit review.

Additional findings included the notion that in successful projects the respondents indicated that a solution integration resource was used in successful in the project. A recommendation to project managers would be to invest in cross skilled resource functioning on both technical and business levels. The challenge to project management is to acknowledge this problem and to address this in the resourcing of projects, early in the project life cycle.

5.2.3 Objective 3: Understanding Change Communications, Training and Stakeholders

This section supported the notion that there is a correlation in the non -technical aspects of the implementation of projects that could identify associated project success. These would include change management, communication and training.

The research confirmed activities that process owners and super users need to be involved in projects with a focused involvement on the full project life cycle, from Blueprinting to User Acceptance testing. The proposed recommendation would be to utilise these resources in a constructive approach throughout the project life cycle, thereby creating a natural change agent. This approach can be further extended in defining define bidirectional communication and alignment between the change teams, business management and key stakeholders from business. This would include structured management of senior stakeholder objectives that potentially are variable in nature, downward in the hierarchical structure, while objectively engaging with technical resources on project constraints and the consideration of these risks on strategy. By aligning key stakeholders to project resources, the process allows for quick resolution of project constraints while creating an opportunity to proactively manage organisational risk. The approach of ERP implementers need to be inclusive of these resources and actively managed to take the ownership of project streams, even with limited

technical skillsets. It is about business alignment to support the value chain and competitive advantage.

The research confirmed the important role of communication in an ERP project. As a recommendation to the project manager the suggestion is a communication strategy that is focused on direct interaction (face to face) with stakeholders, supported by information updates utilising email platforms. The research confirmed that information needs to be pushed to the end user, rather than placing a reliance on stakeholder driven access such as searching the intranet or internet for information.

In a related topic to change management / people integration and communication is the high occurrence of organisational restructuring that is presented in the bulk of ERP projects. The recommendation would be a responsible, professional approach in conjunction with the relevant Human Resources and line management functions to allow for a unified aligned approach to this project risk. The focus being to ensure that the negative association of restructuring is not reflected in the project objectives and is managed as a corporate action where the project is a vehicle for restructuring and not the cause of restructuring.

5.2.4 Objective 4: Understanding Business Analyst / Consulting Skills

The research supported the literature review in terms of the Business Analyst / Consulting resource skillsets that potentially are not aligned in terms of ERP project implementation skills. This project risk is confirmed again, by the research suggesting project success when utilising a solution architect as part of the solution, potentially to manage the alignment of business processes and technical solution design. This risk was further confirmed in the ability of the consultants to facilitate workshops and understanding reporting requirements.

To address the risk the suggestion to the project team is to review the avail resources against a role profile and supplement weakness in engagement from either business or consulting resources with secondary resources in the project stream. As indicated by the research the support structure can be extended by including solution specialist that function on a process level rather than on business or technical level.

5.3 Further research

The research in many cases indicated opportunities for further research:

- The identified opportunities in terms of the skillset of business resources utilised in projects and the related technical skillsets knowledge of business activities. The same applies to the skillsets of consultants that may be highly technically skilled on the one hand, but lack business understanding on the other side. The suggested research should focus on the required skillsets by project contributors and how the project manager could align these two opposite resource skillsets to achieve project objectives.
- Within the change environment there is an opportunity for further research in the operational utilisation of business resources in the change management structure and plan. Rather than focus change management on a project stream, there might be opportunities to utilise business resources more effectively to enable change directly, possibly by changing engagement structures and roles to extend these key role players.
- The survey responses highlighted the opportunity to do further research in communication methods to project stakeholders in relation to modern communication approaches, such as multimedia and social media platforms. A related research opportunity that was not covered in the research points to the staging of information to end users. With the assumption that email and direct engagement is a successful channel to stakeholders, a more formalised structure could be developed to identify the content and type of message to be conveyed to stakeholders at different stages of the project life cycle. A further variable is the differentiation to position communication to different layers in the organisational structure slightly different and at different levels of detail and content utilising different forms of communication.
- A key finding from the research was the reluctance from stakeholders to use electronic learning aids. This finding does highlight opportunities for research on why this is still the case in a modern digital age. Is the approach of the training incorrect, is there a general problem in presentation or is there perhaps a underlying challenge in the adoption of training technology in the workplace?

5.4 Summary

Analysing the results of the survey conducted in conjunction with the literature review, it becomes clear that the variables that could affect the perception of project failure are potentially very complex. Related to these variables are external activities to the implementation project that also correlate to perceptions of project failure such as senior management involvement and quality of communication.

With the modern focus on governance and stakeholder management, such as King IV on corporate management structures, an alternative approach needs to be incorporated into models for ERP project implementation. In conjunction to these management models, structured measures should be incorporated into the communication and change structures structure to manage the negative association to ERP projects that ultimately diminish some of the value these system provide. As per the evidence of the research, the real measure of success is the value realisation that stakeholders perceive. This perception in its most simplistic form, could be a measure of project success in terms of project Return on Investment (ROI). While driving corporate return on the capital expenditure of ERP projects, the corporate objectives in many cases are met, with a positive ROI, even with disruption or some frustration on operation levels. The ROI calculation should however accompany a well-structured implementation methodology, built on organisational objectives that align the multiple dimensions of project input across the project life cycle with well managed stakeholder and project participant input, appropriate levels of management participation, quality consulting input, training, testing and communication. The goal to build a technical solution that incorporates as much stakeholder participation as possible within timelines, budget and scope. The recommendation would be to utilise ROI calculations to quantitatively define project success, while in conjunction with these measurements manage the complex individual variances that could affect the quality of an ERP implementation, as a euphemism of individual perceptions of failure that in many cases are subjective to the experience or information exposure of the responded.

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Appendix A : Questionnaire

Appendix B : Statistical Package correlations

SPSS positive correlation analytics

The statistical analysis was done in SPSS. A breakdown of the results from the correlation analytics performed on the data set is presented below. The SPSS software toolset provided positive correlation utilising Spearman's rank correlation coefficient to project success in terms of project success with a number of survey questions.

Reliability in quantitative research refers to whether the result is replicable, the extent to which results are consistent over time and an accurate representation of the total population under study. If the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable. The method that is commonly used as a measure of reliability is Cronbach's alpha.

The Cronbach's alpha measure was above 0.70 which is an acceptable measure of reliability

Table A1 SPs output - correlation to project success.

| Correlations | | | | |
|------------------|-------------------------|-------------------------|---------|-------------|
| | Questions/Variables: | | Success | ERP Success |
| Kendall's tau_b | Success | Correlation Coefficient | 1 | .942** |
| | | Sig. (2-tailed) | . | 0 |
| | | N | 223 | 223 |
| | ERP Success | Correlation Coefficient | .942** | 1 |
| | | Sig. (2-tailed) | 0 | . |
| | | N | 223 | 223 |
| | Role | Correlation Coefficient | -.367** | -.376** |
| | | Sig. (2- tailed) | 0 | 0 |
| | | N | 223 | 223 |
| | Level | Correlation Coefficient | .392** | .404** |
| Sig. (2-tailed) | | 0 | 0 | |
| N | | 223 | 223 | |
| Education | Correlation Coefficient | -.248** | -.260** | |
| | Sig. (2-tailed) | 0 | 0 | |
| | N | 223 | 223 | |

| | | | |
|-------------------------|-------------------------|----------|----------|
| BPSused | Correlation Coefficient | -0.248** | -0.277** |
| | Sig. (2-tailed) | 0 | 0 |
| | N | 223 | 223 |
| SuperUsers | Correlation Coefficient | -0.517** | -0.517** |
| | Sig. (2-tailed) | 0 | 0 |
| | N | 223 | 223 |
| ChangeManagement | Correlation Coefficient | -0.505** | -0.515** |
| | Sig. (2-tailed) | 0 | 0 |
| | N | 223 | 223 |
| Stakeholders | Correlation Coefficient | .335** | .339** |
| | Sig. (2-tailed) | 0 | 0 |
| | N | 223 | 223 |
| Training | Correlation Coefficient | -0.076 | -0.095 |
| | Sig. (2-tailed) | 0.225 | 0.132 |
| | N | 223 | 223 |
| TrainingQaul | Correlation Coefficient | -0.547** | -0.538** |
| | Sig. (2-tailed) | 0 | 0 |
| | N | 223 | 223 |
| TrainingContent | Correlation Coefficient | -0.365** | -0.376** |
| | Sig. (2-tailed) | 0 | 0 |
| | N | 223 | 223 |
| SeniorMangement | Correlation Coefficient | .433** | .468** |
| | Sig. (2-tailed) | 0 | 0 |
| | N | 223 | 223 |
| Communication | Correlation Coefficient | .517** | .509** |
| | Sig. (2-tailed) | 0 | 0 |
| | N | 223 | 223 |
| ProjectInfo | Correlation Coefficient | -0.047 | -0.04 |
| | Sig. (2-tailed) | 0.453 | 0.522 |
| | N | 223 | 223 |
| Restructure | Correlation Coefficient | -0.278** | -0.219** |
| | Sig. (2-tailed) | 0 | 0.001 |
| | N | 223 | 223 |
| | | | |

There is a strong interim correlation between question 2 and 31. Question 2 being the initial question testing the perception of project success from the respondent, where question 31

was more subjective in reviewing the initial response. High correlation was expected, with the small variable allocated to personal perceptions of the respondents changing after completing the questionnaire.

The positive correlation between project success and business owning the project, aligns to business strategy and objectives requires project direction to be managed at the correct level and by the appropriate business management representation. The research confirms to the suggestion from King IV to manage the involvement of stakeholders at all levels of the organisation, under direction of a strong management structure.

Communication follows a secondary parallel stream. The responses aligned to the importance of communication and the importance of communicating the corporate and project messages. Even infrequent communication that focuses on relevant project information required by stakeholder's correlates to success. The results correspond to the findings of Pecherskaya et al. (Pecherskaya & Lyudmila V. Averinaa, 2016) where communication assist in defining project expectations and reduce end user anxiety during the transition into the new environment.

The organisational level correlation to project success confirms the importance of managing the understanding of the objectives of ERP projects on a level below that of management and senior stakeholder. The correlation to project success based on the involvement of senior management confirms the dependence on the ERP project to align to corporate strategy and business objectives. Senior management involvement by its nature is fundamental to align projects to business rather than technical perceptions on the best technical solutions to business processes and the value chain. Bukamal (Bukama & Abu Wadi, 2016) confirm this finding in their research where high levels of management involvement provide a vital component to project success by commitment to and support of the ERP project.

Appendix C : Ethical clearance approval letter

Appendix D: Turnitin report

Turnitin Originality Report

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